RAILROAD MAN'S MAGAZINE

NOVEMBER

PRICE 15 CENTS

"The Beautiful Rests on the Foundations of the Necessary"

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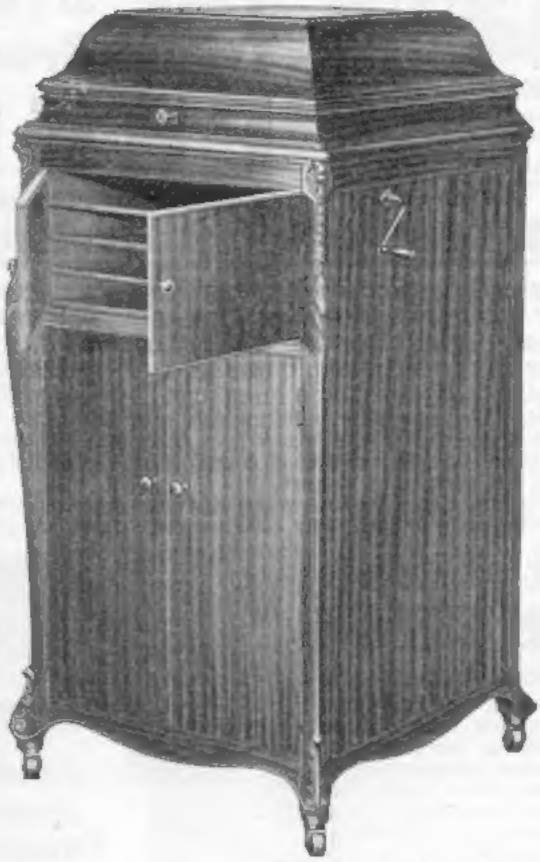

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Mahogany or quartered oak

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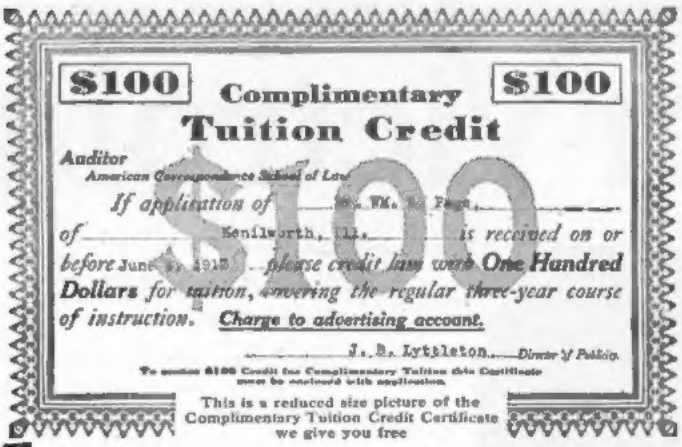

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ISSUED MONTHLY BY THE FRANK A. MUNSEY COMPANY
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FRANK A. MUNSEY, President. RICHARD H. TITHERINGTON, Secretary. CHRISTOPHER H. PAPE, Treasurer.
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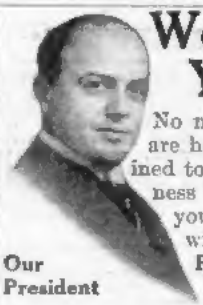

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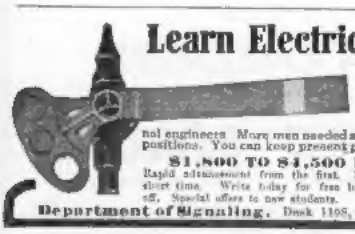

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RAILROAD MAN'S MAGAZINE

Vol. XIX. NOVEMBER, 1912. No. 2.

"MR. PUBLIC, SHAKE HANDS WITH THE RAILROADS."

THIS IS WHAT THE RAILWAY BUSINESS ASSOCIATION ASKS YOU TO DO.

BY CHARLTON ANDREWS.

THE blight of public hostility struck the railroads in 1907. In 1908 the effect of anti-railroad legislation was being felt, not only by the railroads but also by the railway equipment and supply concerns. The mills of many of these concerns, dependent upon the railroads for business, became silent and 600,000 men employed in making things for railroads were walking the streets.

It was then that four men got together at Atlantic City and conceived the idea of forming an association but would have for its object "the transforming of the national grouch to national good nature," and thus help to revive the industries allied to railroads.

GEORGE A. POST, NEW YORK, PRESIDENT OF THE RAILWAY BUSINESS ASSOCIATION AND PRESIDENT OF THE STANDARD COUPLER CO.

Photograph by Pach Bros., New York.

The four men were George A. Post, formerly an Erie Railroad man, now president of the Standard Coupler Company; J. S. Coffin, once a locomotive engineer, now president of the Franklin Railway Supply Company; Charles A. Moore, president of Manning, Maxwell & Moore, and Otis H. Cutler, president of the American Brake Shoe and Foundry Company.

These four men called on the railway equipment and supply men of the country to meet at the Waldorf-Astoria Hotel, New York, September 30, 1908. At that meeting was born the Railway Business Association.

Today this association membership includes the

H. H. WESTINGHOUSE, PITTSBURGH, VICE-PRESIDENT OF THE WESTINGHOUSE AIR-BRAKE CO.

Photograph by Gessford, New York

three hundred biggest and most important concerns in the country engaged in the manufacture of railway equipment, materials and supplies, together with contractors in railway construction, comprising a group of industries employing 1,500,000 operatives, with an invested capital of more than a billion dollars and paying freight bills of $250,000,000 annually.

And one of the notable achievements of the organization was that it played a big part in restoring national good feeling toward the railways, in kindling cold furnaces, starting silent machinery and sending those 600,000 idle men back to the pay window.

The preamble to the constitution of the association sets forth the objects of the organization as follows:

> We, American business men engaged in furnishing railroads with material, equipment, supplies, and structures, in order to solidify our interest, win public favor for railroads and cognate industries, establish just and wise public policies affecting them, and secure for ourselves and our employees the blessings of stable prosperity, do adopt the following constitution:

Its objects have been stated otherwise by various members, thus: To conserve the interests of business enterprises that are dependent for business on railroad prosperity. To study the causes of public discontent and urge the railroads to redress just grievances. To endeavor to convince the public that ill founded complaints should not be made the subject of agitation. To urge that any restrictive laws applied to railroads shall give the railroad managers sufficient latitude to operate the properties solvently.

On the menu of one of the annual dinners given by the association, the object of the organization was expressed thus:

> Amicable relations between the railroads and the public are necessary for the prosperity of both. To be helpful in cementing such relations, the manufacturers of railway materials and equipment, contractors in railway construction, and dealers in miscellaneous railway supplies organized the Railway Business Association. Through this dinner, to be participated in by men from various sections of the country, the association will show that those interested in railways, whether as statesmen, as men of commerce, as manufacturers of appliances, or as transportation managers, are taking thought together how they may promote wisdom in the seats of power, both governmental and corporate. We are inviting those who manage the railroads, those who regulate them, those whom they serve, and those who have put their substance into them, to break bread with us. You shall hear, from experienced publicists, what the railroads may do to foster public approval; from railroad officials what they are doing and mean to do to have the good will of their patrons through increased efficiency and considerateness, and, from the equipment folk, how we are endeavoring in our own behoof to find light and spread it among the carriers and people alike.

The association has no funds save the dues of its members. The initiation fee is $100; the annual dues $100. It has no agents save the members themselves. It is entirely independent of the railroads. No railroad contributes to its treasury so much as a postage stamp, nor has the railroad any voice in its councils.

Its president is Mr. Post, its vice-presidents include H. H. Westinghouse, of the air brake company. Its secretary is Frank W. Noxon, a veritable human encyclopedia of railway information.

Mr. Coffin, chairman of the associa-

tion's membership committee, in making a plea for new members, said: "We have found that there was an important place for a mediator between the public and the railroads and we believe both sides have accepted us as such. We think the mere existence of such an organization, operating independently on lines thought out by ourselves, watching Congress and the Legislatures for instances of threatened haste in legislation, has tended to give confidence where it will do the most good. Gradually the movement is becoming known."

The association already has a record of substantial accomplishment justifying the faith of its organizers. It has affected public sentiment favorably toward the railroads. It has been an important factor in restoring the confidence of investors. It has done and is doing everything possible to encourage the extension of railway transportation facilities.

It has secured from the railway manager, the railway regulator, and the user of transportation, assurances that each will do his part in providing the railways with adequate revenues.

The first task of the association was to impress Congress and the State Legislatures with the widespread demand from business men for a cessation of anti-railroad legislation. Letters expressing this demand from firms and corporations all over the country were sent to Senators and Representatives with resolutions passed by chambers of commerce and merchants' associations in all the large cities.

The lawmakers responded, promised cooperation and soon the number of anti-railroad bills decreased, not only in Washington, but in the capitals of even the most radically anti-railroad States.

For example, "The Man from Texas," at last year's annual dinner of the association, was Mr. Pettengill, representing the commercial organizations of that State, which for a time "regulated" so radically that it drove some of the railroads into bankruptcy. Mr. Pettengill said that, as one result of the efforts of the Railway Business Association in his State, "we point with pride to the fact that not a single restrictive statute was passed at the last session of the Legislature."

He predicted that certain legislation

CHARLES A. MOORE, NEW YORK, PRESIDENT OF MANNING, MAXWELL & MOORE

Photograph by Elmer Chickering, Boston

injurious to railways would be revised at the next session.

At Albany, three years ago, a bill was pending to increase the power of the public service commissions. The Railway Business Association asked its postponement on the ground that when 90,000 employees of railway supply concerns in New York State were out of work and a resumption of railway purchases was largely dependent upon the attitude of lawmaking bodies, it was no time for legislative experimentation.

The association had its hearing following an address by Joseph H. Choate whose prestige had drawn the full committee, most of the Public Service Commission, many legislators and other spectators. The room was so crowded that several members of the Railway Business Association stood up for an hour and a half to see the movement launched. The result was that the bill was withdrawn.

Illinois that year had up about fifty bills affecting railways, including provisions which would have required the outlay of millions of dollars. Several measures had passed one branch and

COL. H. G. PROUT, SWISSDALE, PA., VICE-PRESIDENT OF THE UNION SWITCH AND SIGNAL CO.

Photograph by Aimen & Co., New York.

J. S. COFFIN, NEW YORK, FORMER ENGINEER PRESIDENT OF THE FRANKLIN RAILWAY SUPPLY CO.

Photograph by Bradley, New York.

were pending in the other. The Railway Business Association took to Springfield, the State capital, what was said to be the first train that ever left Chicago on which every passenger had a room to himself.

There were about one hundred heads of manufacturing enterprises. When the association members reached Capitol Hill, Speaker Shurtleff, of the House, sent for the Senate, whose members came running in under the impression that there was to be a roll-call in the deadlock over choosing a United States Senator.

The speaker declared the Legislature in "joint executive session." There isn't any such thing. All the same, that is what happened. Before the lawmakers had had time to ask who these business men were who filled the spectators' seats and overflowed into the members' benches, A. H. Mulliken, a vice-president of the Railway Business Association, was on his feet making his first speech.

It took him about three minutes to explain that "when the railroads are prevented from buying from us by agitation and unwise laws, we are compelled to shut down our works and discharge our men." Then he introduced Mr. Post, the president, who said that "in Illinois there were upward of one hundred thousand men idle throughout the railway supply, raw material and coal-mining industries," and asked that every bill should be subjected to the following test: "Is it certain, beyond a reasonable doubt, that the enactment of this bill, at this time, will not tend to delay still further the reemployment of men now idle?" The result was that no bill affecting railways was passed that year in Illinois.

A bill to extend the powers of the Ohio Railroad Commission had been substituted on the floor of the House in Columbus, the capital, for a measure taken from the foot of the calendar, and without debate carried through in one day to passage by 96 to 16.

No business men or other interests in the State had demanded any legislation of the sort. The innumerable provisions never had been discussed in the press or in public addresses. The Railroad Commission had never been consulted in regard to it. The Railway Business Association formed an Ohio Business Com-

mittee. At the Senate hearing, over fifty manufacturers from Cleveland, Cincinnati, Dayton, and other points were present.

The association's committee urged postponement for further inquiry. Without buttonholing a single Senator, the committee acquainted business men with the situation and later presented to the Senate Committee signatures of many hundreds of Ohio men of affairs, and resolutions from trade bodies urging further consideration before action

The bill which had passed the House overwhelmingly was defeated in the Senate by a two-thirds vote

The association believes in educating the public on the railway question through public discussion. Its publicity department is a marvel of efficiency Through this department the association has distributed tons of popular literature for workingmen employed by railroad equipment and supply concerns

The employees of these concerns cooperate with their employers in helping to convince lawmakers that public opinion calls for moderate measures in dealing with railroads. At the same time the facts in the railroad situation are laid clearly before the newspapers. It was thus that the Railway Business Association induced the newspaper publishers to adopt a rule to give the railroad officials an opportunity to present their side of the case

In setting out to infect the people with a happier disposition toward the railroads, the success of the association's efforts was due largely to the character of its members. The potency of the organization lies in the influence of the members with their neighbors at home They can do what the railroads can not do for themselves

When a member of the association lays the facts before his fellow citizens he is listened to and trusted, because his fellow citizens have cooperated with him in public matters for years and know he will not advocate anything unless he believes it to be in the public interest

Thus the office of each manufacturer in the membership of the association has become a point from which to distribute information to his employees and to exert influence upon the legislators representing his district.

A. H MULLIKEN, CHICAGO, PRESIDENT OF PETTIBONE, MULLIKEN & CO.

Photograph by Moffett, Chicago

A. M KETTLEDGE, DAYTON, OHIO, PRESIDENT OF KAY & ESS CO

From a photograph

HENRY ELLIOTT, EAST ST. LOUIS, PRESIDENT OF THE ELLIOTT FROG AND SWITCH CO.

Photograph by Strauss, St. Louis

Daniel Willard, president of the Baltimore and Ohio, said at the last annual meeting of the association that the public, and especially large users of transportation, could promote general prosperity by advocating conservatism in legislation, but that railways should help bring about the same result by cooperating with the government and avoiding antagonism, which breeds acrimonious public discussion.

Martin Knapp, then chairman of the Interstate Commerce Commission, after reiterating vigorously his conviction that regulation was necessary and urging upon all concerned the view that if it was to succeed and government ownership to be avoided, vigilance must be exercised. He declared that the railways must be permitted earnings sufficient to attract capital for new construction, to pay liberal wages, and to put large sums into betterments without increasing capitalization.

John Claflin, the dry goods merchant, was then introduced as probably "the largest payer of high-class freights in America." He said that as an investor in mercantile establishments in many cities, whose income would be affected by an advance in rates, he had made an investigation. As a result, he believed that merchants by paying some increase in freight rates and thereby giving the railroads the power to go ahead with development would gain in the profits on the increased business due to railway buying and increased prosperity, at least twice what they would pay in increased freight charges.

The railroads are the most direct beneficiaries of the association's efforts, and railroad managers have time and again expressed their appreciation of the value of the association's methods.

R. S. Lovett, of the Harriman lines, said: "I am in hearty sympathy with the work of your association."

A. L. Mohler, president of the Union Pacific, wrote: "The association has done much to stimulate sane thought, is tremendously interwoven with the prosperity of the nation and transportation lines, and is certainly making its influence felt."

Marvin Hughitt, president of the Northwestern, said: "The purposes of your association in its self imposed position of conciliator between the railroads and the public generally impress me as being founded on sound business principles. Your methods merit the confidence of all those whose attention is drawn to your organization and its commendable work."

President McCrea, of the Pennsylvania, said: "I am in full sympathy with the work of the Railway Business Association and feel that its results will be beneficial to the entire country, inasmuch as one of the principal aims of that body is to secure careful and full consideration of all proposed legislation."

President Finley, of the Southern Railway, expressed his "high appreciation of the work of popular education being carried on by the association."

When I asked Secretary Noxon to state precisely what the association is driving at to-day, he replied

"Freight rates and railroad revenues, but we do not advocate higher railway

freight rates and we do not urge any change in any rate schedule. All that we discuss is the method and results of regulating rates.

"What we are concerned about is that regulation shall be so accomplished that it can be known at all times that rates are yielding sufficient revenue in the interest of all concerned. Compare business in 1912 and business in 1910. The roads as a whole took in 3.1 per cent more and paid 7.7 per cent more in expenses and had left 5.5 less.

"The more business they do the worse they are off. That spells trouble if it keeps up. It spells very serious trouble already for two classes of people. The first class is the shippers who will not be able to get cars unless reports of railway earnings attract new capital for additions to rolling stock, track, and terminals. The second class is the industries represented by our association which cannot keep their factories going and their men employed unless the roads are in position to buy their goods.

"In the end it will mean trouble for the manufacturers, employees, and the whole consuming public." It is our best information that the shippers of the country fear car shortage and desire railway credit to be strengthened. It is our belief that as the facts become known to the general public and to the government officials, the government will adopt a policy to meet the situation. It is our job to make known these facts where the knowledge will do the most good."

LAYS TWO MILES OF TRACK A DAY.

THE modern track-laying machine should not be confused with track-laying tools, as this machine is not a tool, but a real machine that actually lays tracks, says *Scientific American*. The machine moves steadily forward over the track it lays at a rate of from twelve to forty feet a minute. At the rear of the track-laying machine are cars loaded with ties and rails.

The rails are drawn forward on rollers and are connected temporarily one to the other. As the rails pass under the cars which carry the ties the latter are distributed upon the rails and spaced apart uniformly.

The chain of rails thus serves to transport the ties toward the track laying machine. As the rails enter the machine, the ties are picked up by a conveyer and carried overhead. They are distributed on the road-bed at the end of a truss that reaches far in advance of the main body of the track-laying machine. The rails in the mean time are carried forward and deposited upon ties previously laid. The truss may be swung to one side or the other in order to allow for passing around curves. The track laying machine is self propelling. It hauls a train of twenty five cars of material, more or less, depending on the grade. A train of twelve cars will carry enough material for a mile of track. This machine, with eighteen men, including spikers, can lay and bolt and spike a half a mile of track a day. With a larger force of men two miles of track may be laid in a single day.

RAILROAD PLANTS 4,500,000 TREES.

MORE than 4,500,000 trees have been planted by the Pennsylvania Railroad in the past ten years. This fact is brought out in a report which shows to what extent the Pennsylvania Railroad has undertaken the conservation of the natural resources of the territory traversed by its lines. Last year 515,703 trees were transferred from the company's nursery at Morrisville, Pennsylvania, to permanent places on railroad property. At the nursery the Pennsylvania has in operation 36 acres, which are kept up to practically maximum production. In 1911, 483,148 forest trees were shipped from the nursery for company use, while an additional 46,558 ornamental trees and shrubs were used by the various divisions. The present stock on hand at the nursery is 2,296,833, of which 2,072,166 are forest trees and 224,667 ornamental plants.

In addition to growing ornamental shrubbery and trees for its future requirements of ties and lumber, the road established two tie and timber treating plants—one at Mt Union, Pennsylvania, and the other at Greenwich Point, Philadelphia. These plants were in full operation in 1911, and 869,000 cross ties, 13,000,000 feet of lumber and timber, and miscellaneous products equivalent to about 2,500,000 board feet were treated. Reducing this to a cross tie basis gives the company an equivalent of about 1,250,000 cross-ties treated in 1911. The total amount of creosote used in these operations was 4,492,000 gallons.

BENT ON DESTRUCTION, THE INSURGENTS CUT AWAY FILLS AND EMBANKMENTS, AND IN THE DEAD OF NIGHT, TRAINS LADEN WITH FEDERAL SOLDIERS PLUNGE TO THEIR DOOM FROM THE UNSUPPORTED TRACKS

Photograph copyrighted by Scott Photo Co. El Paso, Texas

RAILROADS IN MEXICO'S REVOLUTION.

Hundreds of Miles of Track Destroyed, Rolling-Stock Ruined, and the Lives of Railroaders Placed in Constant Jeopardy as Insurgents and Federals Fight Bitterly for Supremacy.

BY EDMUND G. KINYON.

RAILROADS have played a most important part in the frightful revolutionary troubles which have beset Mexico during the last two years. In the northern part of the republic, two lines, the Mexican Central and the Mexico Northwestern, have for months been the pawns of two contending forces, who have used them ruthlessly as best suited the exigencies of the hour. All ordinary railroad troubles pale into insignificance in comparison with the deplorable conditions which the operators of these two lines were obliged to face week after week in their efforts to keep trains moving.

The Mexican Central is a branch of the National Lines of Mexico, an extensive system controlled by the government. It extends from Juarez, on the northern border, opposite El Paso, Texas, to the City of Mexico, a distance of over one thousand miles. More than one-half of its trackage has been cut to pieces, not once, but half a dozen times during the progress of the Madero and

Orozco revolutions, entailing enormous losses

The other line in the northern war zone, the Mexico Northwestern, extends from Juarez to the city of Chihuahua, a distance of four hundred miles It is owned by a syndicate of English capitalists, who have been forced to witness the destruction of their property time after time without being able to raise a hand to protect it.

For months during the rise and fall of the Orozco propaganda both of these lines were under the complete control of the insurgent forces. They coolly took possession of trains, rolling stock, telegraph lines, shops, and offices and proceeded to operate the systems for their own advantage and profit. As far as possible the old employees were forced or persuaded to remain at their posts, vacancies being filled by such recruits as were available from the insurgent ranks. High wages were offered for outside railroad men to operate the trains, but owing to the dangers there were very few responses to the insistent calls.

When routed by the federals, it was the custom of the insurgent forces to fall back along one or the other of the two lines, destroying the track as they went in order to impede the advance of the federal army, whose troops and heavy artillery were moved almost exclusively by train

These tactics were practised for a distance of over five hundred miles along the Mexican Central and later repeated along the Mexico Northwestern. At intervals, both before and after Orozco's supreme effort at destruction, during the summer of 1912, long sections of both lines were cut and the passage of trains made impossible

It was the custom of Orozco, on his retreats, to detail a destruction brigade from his army. This brigade worked systematically and thoroughly. They proceeded slowly by train over the line, tearing up the track at their rear.

In order to make repairs more difficult, the ties were piled at intervals and burned and the rails were heated in the fires and bent with heavy sledge hammers. All bridges and culverts were burned or dynamited. In some places even the grades and fills were dynamited.

In this drama of war in Mexico the curious spectacle was often witnessed of a railway line being destroyed by the insurgents, in the manner described, while not more than twenty-five miles distant

WRECK OF ARMORED TRAIN AND DYNAMITE-CHARGED LOCOMOTIVE FOLLOWING A COLLISION NEAR TORREON MEXICO THE PHOTOGRAPH SHOWS THE DYNAMITE-CHARGED LOCOMOTIVE WITH FORWARD PORTION BLOWN AWAY THE WRECKAGE AT THE RIGHT IS PART OF THE ARMORED TRAIN IN WHICH SIXTY FEDERAL SOLDIERS LOST THEIR LIVES.

Photograph copyrighted by Scott Photo Co., El Paso, Texas

followed a large federal construction crew rebuilding. New ties and bridge materials were quickly taken from the forests and steel rails rushed from the capital with such facility that only a few weeks would elapse between the destruction of a line and the time of its being again in temporary operation.

In the case of the privately owned line, the same conditions prevailed. Heroically, time after time, the owners went forth to rebuild their mutilated railroad, not knowing whether it would be allowed to stand intact for even a week, or whether the engineers and workmen would escape with their lives from the maelstrom of war raging around them.

A notable incident of the Orozco uprising was the encounter between a federal armored train and a dynamite-charged locomotive controlled by the insurgents. The armored train was proceeding cautiously from the south, through a country infested by insurgents, one day during the early months of 1912, carrying several hundred federal troops, when the enemy hurled its death-dealing engine against it.

Carefully concealing the locomotive charged with several hundred pounds of dynamite around a sharp bend at a point near Torreon, the insurgents allowed the train to approach within two hundred yards. Then the engineer started the catapult on its mission of destruction, opened wide the throttle, and leaped off.

It sped around the curve and dashed upon the armored train with terrific velocity before the trainmen or soldiers could make a move to save themselves. With the collision came a mighty explosion, blowing a large portion of both the armored train and both engines from the track. Sixty federal soldiers and several trainmen lost their lives in the disaster.

During the two years of incessant struggle in northern Mexico, the two railroad lines proved of great value both to the federal and insurgent forces, as well as to the citizens of the war-pillaged country. The side which chanced to be in control utilized the lines to transport their troops and supplies

During last July the Mexico Northwestern conveyed over four thousand menaced colonists from their farms, one hundred and fifty miles south of the border, to a safe refuge in the United States, thus saving them from probability of suffering death or great indignities. So great was the danger that no fares were exacted, all available trains being placed at their disposal free of charge.

NEW CAR FOR SAFETY INSPECTION.

FOR the purpose of ascertaining the condition of track in regard to the gage on tangents and curves, the elevation of the outer rail on curves, low joints and other irregularities in rail or road-bed, and to make comparisons with established track-standards, an inspection car, containing testing and registering apparatus, has been designed and is now in operation on the Erie Railroad. The car is largely the work of E. G. Chenoweth, of Meadville, Pennsylvania, mechanical engineer of the Erie. The car is 66 feet 1 inch long, and is provided with a three-foot rear observation platform and a two-foot five-inch front platform. The observation-room in the rear of the car is 23 feet 6 inches long, and 8 feet 8 inches wide It is provided with the largest window space available in the rear so as to give an extensive view of the track. One of the most interesting features of the many tests and registering apparatus is that to show track irregularities. The device is so arranged that the inequalities are indicated to the trackman by the ejection of colored liquids upon the road-bed. The recording apparatus makes autographic records for office use, with reference to irregularities of track surface, variation in gage, cross level, and car swings, lurches, speed, and distance traveled, and time consumed in five second intervals. Mr. Chenoweth says the car, by noting the many little imperfections in trackage, will greatly aid in averting possible dangers to high-speed trains.

Ideas are the motive power of the mind.

HE FELT THE ATMOSPHERE OF DISLIKE MORE THAN THE KEEN WIND

When the Wrecker Was Wrecked

It Was No Place for a Silent and Timid Man With Men Facing Death in the Burning Debris.

BY C. H. CLAUDY.

BLINKY MASON, foreman of the wrecking-crew, lived up to his nickname and blinked at the big man who stood, shambling, in front of the cigarette-scorched desk in the little office.

"*—and for the love of Mike send me a man with some real meat on his bones who won't need two men to help him to lift a tie or handle a bar,*" he had written a friend at headquarters in private, though his formal application for a hand to take the place of Morgan, married and departed for other fields, had been conventional enough.

"They seem to have done it!" he conceded mentally, sizing up the new man distrustfully. "Lot of muscle—slow wits—looks like a farmer."

"What's your name?" he demanded, laying down the letter in his hand

"Rufus Choate Aspinwall," answered the man in the faded blue overalls

"*What?*"—er—just so!" The foreman blinked again. "I suppose they call you Rufe. Well, Rufe, we've a big yard here and there's always plenty to do, and the man who does his part will find he has no complaints to make when pay-day comes around. But the work here is different from what it is at Alton when the whistle blows for a wreck, you drop what you're doing and hike for the wreck-train, and when you get aboard, *you obey orders* as you never did before. Wrecking is serious business and there's no time to answer questions. Think you can?"

"I reckon so," said Rufe somewhat

slowly. "The big boss said you paid over the scale."

"We do if you're worth it!" dryly snapped Blinky. "And it won't take long to find out, either. Report to Reddy in the yard.

"Nor will it, more's the pity," thought the foreman. "Simpson's division hasn't had a pile up for six months, and that's a record. And if that rotten track up Clear Fork Pass doesn't dump something soon, I'll eat my vouchers. This is sure the damndest run line on the map!"

Though Blinky, true to type, could pick holes in the running of the S. N. and L. W. for an hour and never draw breath, there was some justification for his strictures. Wrecks occurred on the two mountain branches with surprising frequency. The care that despatchers took of the passengers seemingly used up all their stock so that freight pile-ups were more than common.

Once in a while poor equipment and insufficient track supervision laid an express in the ditch, but the resultant jacking up of the service did not last long enough to produce permanent results. It was, as Blinky knew well enough, because of watered stock and hungry stockholders that repairs were made with stingy hands and equipment worn long past the safety point before replacement.

Because of frequent practise and a strong personality over them, the wrecking-crew which raced out of the Longport yard with the big crane and Sammy Albough pulling in 72, to right the mistakes some one had made, had developed into a highly skilful organization. They possessed an *esprit de corps* which is likely to follow when strong men work continually together for a common end, under a leader as much loved as feared, as much respected as detested.

If Blinky Mason had been more human to his men, he might have been better liked and obtained less results, but for every curse his sharp tongue and strict discipline brought him, his fearlessness and quick wits and his masterly handling of a tangled mass of splintered cars, tumbled freight, and scrapped-up engines brought him admiration.

A strong man himself, Blinky tolerated none but strong men on his pet crew for though he swore openly and vigorously at wreck duty, it was only in the midst of such excitement, when the lines must be cleared in two hours of a mess that required ten, that the foreman really enjoyed life to the full.

"And Mr. Rufus Choate Aspinwall—Lord, what a name! doesn't look like my kind a little bit!" thought Blinky, sniffing after the slowly retreating figure, "and I won't have him if he can't get placed with the boys, either."

Mr. Mason knew to the last ounce of efficiency just how much the solidarity of effort and willingness to work together which had been developed in his crew, counted in speed. And the occasional "good work" which came over the wires when he cleared up a derailment in half the time headquarters expected, was dear to his heart.

Of this Rufe knew nothing, as he plodded out to find Reddy. He found a little man putting all his hundred and forty pounds of solid bone and bulging muscle into an unavailing effort to pull over a jammed switch-handle. With only a natural desire to help, Rufe pushed the little man to one side, laid hold of the refractory lever with one mighty hand, and, without effort, pulled it over just in time for a shunted car to roll into the siding for which it was destined.

"Some strong man, ain't you?" sneered Reddy, white hot because he hadn't been able to pull it himself. "Who you think you are, buttin' in here?"

"My name is Rufus Choate Aspinwall," said that individual, unemotionally. "The boss up in the office said to find Reddy and report."

"Did, did he?" grunted Reddy. "Well, you've found him. And let me tell you one thing, right now, you mastodon, you don't go pushing me 'round and pulling my points and get away with it. I'd 'a' had it in plenty of time. Go on over there, now, and get busy on that string of empties—let's see if you can pull pins like you can switches."

Thus, with the handicap of his foreman's distrust and his yard-master's active dislike, Rufus Choate Aspinwall went to work in the yard at Longport.

Rufe was no new hand at yard work. They knew at Alton that he had a clean record of three years' work in the yards

there, and there were at least two special records in which the queer name of the big man with the slouchy shoulders had figured in a way not to his discredit.

Blinky Mason sensed some of this in Rufe's having been sent him, and even admitted to himself that he "had nothing on him" by which to base a judgment. But Reddy knew only that a big man with more strength than his share had "shown him up," and carried the grudge to the shade of the roundhouse for lunch.

Rufe had been unfortunate during the morning. He had missed a coupling in making up the string of empties which was to be No. 58 bound east, and had received some very pointed remarks from O'Loughlin in the cab of the hog-back being used for switching duty.

"What the Sam Hill do you think this is—a kindergarten for railroading?" the acting engineer had said, after having reversed twice and used his sand stopping and starting the long string.

Rufe had said nothing at the time. What was the use? He knew the coupling on the flat he had missed was low, and that he was lucky to have made it in two trials, but he was not quick enough of speech to think of an answer while O'Loughlin was passing. He took, too, with a philosophy which sprang as much from kindness of nature as from slow speech, the steaming O'Loughlin gave his legs, opening his cylinders and jerking at the throttle so the drivers spun as he passed.

The yard force had caught only echoes of the feeling between Reddy and O'Loughlin and Rufe, but they sided with their own, and waited in silence for Rufe's reply when O'Loughlin, picking his teeth after the serious business of his lunch-can, said to Reddy.

"Curious looking specimen you've got there. If you can't put a real pin puller on when I'm making up empties, you might let him pull switches and pull 'em yourself!"

Unknowingly, O'Loughlin had touched a sore spot.

"He knows too much about switches now!" Reddy flashed back. "Hey, you Rufus Coat As—Ass. I forget the rest but that's your real name. you get off mighty quick if you can't make 'em any better than you did this morning. First you butt in on me and then you break a string, and for all I know 29's got a flat wheel as a result. What you got to say for yourself, hey?"

"The coupler on that flat is low," slowly answered Rufe, and apparently unanxious. "I called for slow but he pushed her right through. The string was too long for the speed and she bucked."

"Why—why you you track-walker, you!" roared O'Loughlin, springing to his feet. "You trying to say I don't know how to run an engine?"

O'Loughlin, who had not been given an engine, though he ran No. 29 on yard duty, was touchy about his skill.

"No," answered Rufe patiently. "I'm not trying to say anything. The couplin' was low. You did push her through. I did call for slow."

"You're a liar!" cried O'Loughlin.

"Maybe," returned Rufe, placidly, putting half a sandwich into his mouth and speaking thickly as a result. "But not because you say so."

O'Loughlin stared. A ring of interested faces formed about the two. O'Loughlin, fists clenched, standing, Rufe sitting quietly, eating. A man who did not resent being called a liar was a novelty to the Longport yard. When the man was over six feet and apparently very strong, he was more than a novelty—he was a phenomenon.

"I say you are a liar!" repeated O'Loughlin. "Did you hear me? A liar! Any man who says I don't obey signals switching is a liar!"

Rufe got slowly to his feet and faced his tormentor. There was nothing in his movement to indicate offense, but O'Loughlin chose to think so, and two solid fists shot out one after the other. One was dodged with surprising speed for so slowly moving a body, and the other was caught and held in a grip which O'Loughlin could not break.

"You call me a liar!" he said.

With no apparent effort whatever, Rufe caught O'Loughlin's other hand, transferred both to his left, and held the struggling fireman helpless with one hand. With the other, he reached over O'Loughlin's back and grasped him by his belt. Then, still slowly and without effort, he raised the helpless man up in the air and set him down again, gently, on the ground.

"I don't want to fight," said Rufe patiently. "You know you did run that string too fast. You know you are wrong. And you are not enough my size to fight."

Another man might have been awed by

backward, caught by a clean swing on the jaw.

When he arose from the pile of pins and couplers which had received him, he knew that the mark on his chin was the least of those he carried that the in-

RUFE PUSHED REDDY ASIDE, AND, WITHOUT EFFORT, PULLED THE LEVER OVER JUST IN TIME.

the exhibition of brute strength which Rufe had given. But O'Loughlin, knowing that he was wrong, and fearing the laughter of his mates more than he feared personal injury, was no sooner released than he sprang again at Rufe and rained a hail of blows upon him.

To the utter disgust of the assembled crew, Rufe made only ineffectual efforts to defend himself, and finally pitched

visible mark which decorated him set him as much apart from his mates as would the leprosy.

But he said nothing. Nor was anything further done. He escaped the rude jokes and the laughter which he would have welcomed as exhibitions of fellowship. He was subjected to no more taunts regarding his work. He experienced no more difficulty in making

couplings. His signals were carefully obeyed. Engineers ran switching engines at his waving arm or swinging lantern with a care they never gave to those with whom he worked side by side

No one addressed him on coming to work, no one spoke to him at lunch hour, no one bade him good night. He was as much alone as if working the yard single handed—a phariah, an outcast, a man without place or mates, though on the pay-roll and a member of a crew. For Rufe was branded "coward" in the minds of those with whom he worked, and as such, beneath either friendly notice of rough joke and beyond companionship

"It's all right in the yard," Reddy had complained to Blinky Mason. "The boys can stand it as long as he can. But when you pull out the crew after a pile-up and take that that make-believe man along, there's going to be trouble. For the boys won't have any confidence in him, and they won't be able to work with him the only reason you haven't had trouble with 'em over him is that they think he'll quit of his own accord—like Bumps Peterson did when they found his yellow streak"

"I know, confound it!" agreed Blinky. "But it's like pulling teeth to get a man from Alton, and you know what we can pick up around this forsaken spot. The crew is short-handed now, and this bucko is strong as a mule

I wish I'd seen him hold O'Loughlin up in the air. I can't understand how a chap with all his strength could let a man he can handle like he can O'Loughlin knock him out. Why, he's built like a steam shovel."

Indeed it was that, rather than the licking, which had ostracized him

"Fer a mon kin be licked an' shtay a mon all roight," said Danny Williams, "but he can't be licked by shtandin' shtill an' littin' th' ither feller roide over him, an' be anythin' but a cur an' faith we're supposed t' pull timbers an' yank scrap wid th' loikes of thot!"

Rufe had been in the Loganport yard but a week, when the whistle blew loudly, screamingly, long drawn out, and from everywhere men came running, leaving switches half pulled, trains half made up, and Reddy in despair at what he would do with a congested yard

"Sixty-seven has piled up eight miles beyond Crank's Run, Clear Fork pass!" cried Blinky, swinging aboard the crane as Sammy Albough pulled it past the office. "I knew it was coming—those rotten lines!"

As No. 67 was the west-bound fast freight, and ran only two hours ahead of the limited, every one knew that there was no time to waste in the yard.

"What's O'Loughlin doing firing for Sammy?" asked Blinky of Danny Williams, the nearest man, as he swung over from the crane into the caboose. "Where's George White?"

"Darnedfino," returned Danny, busy over his pipe

Even the excitement of wrecking could not draw a semblance of emotion from any of the Longport crew—it was a point of pride.

"Well, any one know?" demanded Blinky, testily. "Is this a wrecking crew or is it a Sunday-school picnic?"

"White was in the tool-house, last I saw of him," ventured Rufe, although it cost him an effort to speak, knowing that, to whomever the general question was directed, the foreman did not expect a reply from him. Nor was he surprised at the short reply he received, nor wince outwardly at its form.

"I didn't expect *you'd* know. I was asking the *men!*" cut the words But if Blinky had not been harassed at the absence of Albough's regular fireman, he would not have finished his reply as he did. "What you doing here, anyway? I've got no use for yellow streaks on a pile-up job."

Bob Enright laughed loudly.

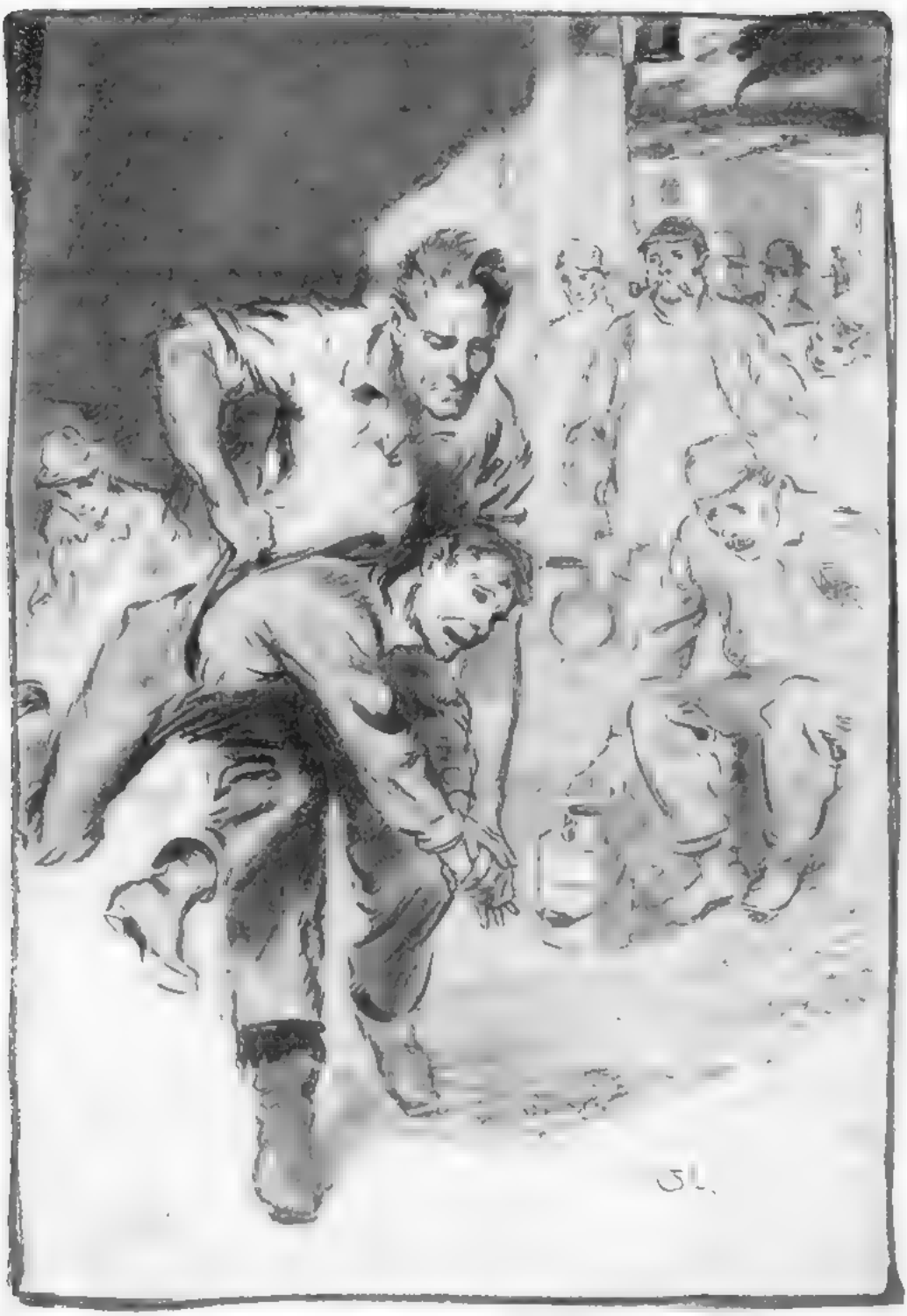
"I'm here because you said when the whistle blew I should like for the wreck-train and obey orders," Rufe made answer with dignity, paying no outward attention to the laugh.

No one but Rufe knew what was going on in the big man's slow mind, nor how he felt the position, false as he knew it was, into which events and an inauspicious beginning had forced him.

Blinky, realizing that there was no answer to this, had the decency to growl:

"All right so I did—see that you do!" The tone was ungracious enough.

Rufe was sitting in a corner. He stood up now and looked about him. No friendly eye met his, nothing more com-



YOU ALL ME A LIAR

forting than a suppressed chuckle greeted him. Dick Whinning was rolling a cigarette. Stumpy Shotten busied himself with a boot lace. Garde was tracing figures with his fingers on the dusty window pane. Danny Williams was puffing contentedly at his pipe.

The morning air was sharp and all the crew were in the long caboose, but Rufe felt the atmosphere of dislike and suspicion more than he would the keen wind on the open crane. So after a minute or two, not to seem to run away from a jibe, he opened the door, stepped across to the crane and sat down on the edge, letting his feet dangle.

O'Loughlin, clambering back over the coal to rake it down, spied him.

"Look who's here!" he cried to Sammy in the cab. "The elephantine lifter of weights! What you going to do at the wreck, Mr. Rufus Ass? Better step back real careful when the crane pulls up—something might hit you—maybe in the jaw!"

And O'Loughlin laughed at his own attempt at wit.

Rufe said nothing. There was nothing to say. He was "in bad" and knew it—knew, too, that nothing he could say would alter the men's attitude. Even if he told fully and frankly why he wouldn't fight, he would be mocked at and disbelieved

Sammy knew that seconds were worth dollars. The location of the wreck told every one that the time required to cut it out and pile it up to one side, so that the limited might not be held up unduly with the vexatious results of delayed mails and official inquiries, was all too small for the job.

He opened her up and cut back the lever until the engine was pulling for all there was in her, and the caboose flipped around curves like the knot on the end of a flicking whip.

But the very speed which was to save time, lost it, though even Blinky admitted later it would have happened at any speed. Rounding a sudden curve, nine miles away from anywhere, the pilot wheels of No. 72 jumped a spread rail.

The results were peculiar and distressing, and resembled, as Danny Williams remarked later, nothing so much as an "artishtic attimpt t' make a pile-up phwat wud be a cridit t' th' crew t' take apart." When the pilot wheels jumped, the engine slowed suddenly. The heavy crane bumped into the tender and threw the engine forward just as the front wheels of the pilot struck between two ties.

No. 72 had kept her balance, though rocking and pitching dangerously, but this was a little too much, even for the big compound, and she forgot her weight and dignity and turned a somersault, to end up with a long, sidewise slide on the ties

Into what was left of her the crane piled head-on, spreading itself in a twisted scrap of iron, cables, and cogs, about the steaming tangle of the thoroughly wrecked engine. On top of this bucked the caboose, just in time to get the back lash of the writhing mass, which promptly buried it under several tons of flying metal, the curved arm of the crane falling like a mighty flail across the roof of the caboose.

Where a moment before had been a smooth running train, rocking and lurching with the violence of its speed, was now a smoking, burning litter of wood and iron, from which issued fearful sounds which resembled nothing human.

Rufe, sitting on the edge of the crane, was thrown clear at the first jolt. He landed on his back in the ditch, rolled over half a dozen times, and finally brought up sitting, dazed, bruised, and with no very clear idea of what had happened. His body had been utterly unprepared for the flying leap he had been made to take, and landing limp, had not suffered as much as might have been expected.

Rufe picked himself up, limping. The blood flowed freely down his face from a gash over his eye. He wiped it away absently, listening with a paling face to those sounds of pain and anguish. Seeing, as through a red mist, the wreck spread over the rails, he staggered toward it.

As he ran, he saw two other figures gather themselves up and stand upright near the wreck. One Rufe recognized as Danny Williams, the other as Sammy Albough, the engineer.

Of the crew of sixteen men, these three only stood without the pile. Danny held one hand with the other and

screwed his face up with the pain of a broken wrist. Sammy staggered for a moment, and then, lurching toward the smoking ruin, collapsed, his hand to his side.

"I can't—make it!" he gasped. "My ribs—I can't—" and fell over in a faint.

The queer sounds increased. Rufe wiped the blood again from his face and broke into a run.

"Hurry, Danny," he said to Williams. "Those are men screaming—the fire's getting them—hurry!"

"Hell—I know ut," answered Danny. "Phwat's t' do?"

Feverishly he turned away from Rufe, to hunt for an ax that he might—Danny shuddered at what he must do with the ax if he found it. Only a man who has been pinned in a burning wreck—and Danny had knows what it means to feel the fire burning toward him and to realize that unless help comes in a very few minutes, he must burn to death.

Danny, whose chest and arms bore scars from just such an experience, remembered how he had railed at and prayed to the men who fought the demons of iron and wood which held him down, for the ax stroke which should send him to his end at least without the agony of fire.

Rufe staggered on alone. When Danny came up, a pinch bar, all he could find, in his one good hand, he saw that which made him gasp.

Regardless of smoke which choked, of flying sparks which stung, and of flame which threatened to burn him alive, Rufe was tearing at the wreck of the caboose with his naked hands.

Danny guessed his purpose.

"Man—man!" he shrieked in Rufe's ear. "Ye can't do ut—'tis sartin death an' ye wance git in—luk at ut wance—oh, my God, th' poor 'byes—burnin' burnin'—"

Rufe paid no attention to the Irishman save to grab the pinch bar from his hand and with it wrench at the burning boards. And even as Danny, his flesh shrinking at the memory-inspired terror, though he himself was in no danger, started again to protest at the useless sacrifice.

Rufe made an entry, lurched forward, and disappeared in the burning mass. Straight into the heart of the furnace he went, tearing an opening with the strength that was in him, crawling through fire and under twisted beams and coils of wire rope from the crane until his hands struck something soft.

As Danny looked, cursing his broken arm, a well-known voice came in familiar accents, above the sounds of those groans and cries which were as icy, clutching hands to Danny's heart:

"Hold it, Rufe, hold it I'm loose—I can get him."

Danny saw Blinky stagger out, a battered figure in his arms. Dropping it a scant five feet clear, Blinky charged back into the burning pile-up, and Danny, forgetting both broken arm and fear, crawled after him.

"Danny—good. There—Mike next. Rufe's holding it up—quick man, move—there's no time—"

Danny took but half a look. He had learned long ago to obey orders first and watch afterward. It was Mike's leg he saw. He knew it by the red socks Mike always wore. His good hand, added to the ten Blinky seemed to own, pulled a limp figure clear. He did not understand it exactly—there had been no opening there a moment ago

And now here was Blinky and they had pulled Mike clear and—yes—there was another figure being hauled out Rufe had been there—but where was he?

As they worked, matters became clearer to Danny's mind. The caboose, in bounding forward, had been squashed flat by the crane-beam, up-ended and torn loose from the crane-car by the impact. The long caboose, being of wood, had splintered into pieces, but its roof beams had partially held, and mashed up among them and the small space between them and what had been the floor of the caboose and was now a splinter-laden track, were all that remained of the wrecking-crew.

The whole was on fire, and in the fire, somewhere, was Rufe, doing something—Danny didn't know what.

"For the love of Heaven—don't—don't let it get me—"

It was O'Loughlin's voice, rising clear above those other sounds, no less terrible that they were wordless. Danny knew it—and Blinky knew it. So did Rufe know it, though how O'Loughlin got under the wreck of the caboose from the engine no one then knew or cared.

Rufe heard, and hearing, answered.

"Hold on a minute," he cried, the words rising clearly above the noise of rushing steam and the ugly sounds of men made mad by pain. "There's two more under this beam—then I'll get you."

Then Danny saw through a swirl of smoke what Rufe was doing, and found time even then to marvel. Standing on burning boards, the heat of which had stripped the clothes from his body, with his hair singed from his head, Rufe stood, a giant, bowed and blackened figure, unheeding the pain of his burning flesh.

With his back under the roof beams, Rufe was lifting. Only a part of the weight of the crane rested on them, or even superhuman strength would not have moved them. But Rufe managed to lift them, and held them on his shoulders, while Blinky and Danny pulled at the legs and arms thus released. And of those figures who were passed out of the hole Rufe's hands had torn in the side of the wreck, some, recovering in the air, returned to lend what arms and hands they had unbroken to the rescue of their comrades.

No time, this, to look for rope and jack, for crane and pulley, for ax and peavie and pinch-bar. With the fire, started from the scattered coals of the engine, burning fiercely in the dry wood of the weather-worn caboose, what had to be done must be done then and quickly, or not at all.

Over all was the undercurrent of those sounds which so distressed Rufe, the coward—the sounds of men in agony and so close to death in its most horrible form that the pride which keeps a man silent under pain had fled.

One by one the fire drove the rescued rescuers back—singed and scorched and blinded. But Blinky, his teeth meeting through his lip, kept his feet and head, and Rufe still stood his post, using to the best effect the strength which had been the measure of his disgrace.

O'Loughlin was taken out, more dead than alive. Bob Enright was taken out, to rid the confined space of a dead body. Crushed at the first blow, he had suffered no pain. Even then Rufe remembered it was he who had laughed—and was sorry for the memory. One by one they got them out—Dick Whinning, Stumpy Shotten, Will Garde, and other bodies, so maimed and blackened none could give them names.

Blinky, working to save his crew as he had never worked on a wreck before, forgot that Rufe was human. During all the terrible minutes which lived so long and were so few, Rufe had uttered no words but those he had said to O'Loughlin.

And so secure did he stand, and so limitless seemed the strength with which he bowed his back and heaved and lifted on the imprisoning timbers, that Blinky accepted him as a factor in the game they played together which would no more change than his own steadfastness. Occasionally he issued an order:

"This one now, you—" or, "Two inches more, quick, and I'll get him."

But there came an order which Rufe didn't obey. It was when Blinky spoke of Buddy Sullivan, who was lying, crumpled up, in the remains of a bunk.

"Pull up on that—he's dead—but we don't want him to burn—lift, man, *lift*."

But Rufe did not lift. Blinky, cursing, saw that Rufe was sinking under the strain. He had just time to jump clear when Rufe and the roof collapsed, the one to lie, an inert log, across the burning boards beneath his feet. But the roof, settling, did not quite choke up the twisted hole of egress, and Blinky, swearing now as even Danny Williams had never heard him swear, tugged furiously at the fallen figure.

He emerged finally, to drop his naked burden down at the feet of what was left of sixteen burned, crippled, twisted and blackened men, six of whom had cleared their last wreck.

Blinky looked curiously at his hands. They were smeared with something, for a moment he knew not what. Then, with a horrified glance at the seared hulk at his feet and the red marks showing where the blackened skin had crisped away from the tortured flesh as his hands had pulled on it, he did that which no man before or ever since has seen him do—knelt on the ground and sobbed the racking sobs of a strong man whose nerves have snapped in two.

"And we—we called him—coward,"

said O'Loughlin, softly, looking at the ten who were left, and thinking that all but two might have been in the now flaming ruins had it not been for the man who could stand in fire until fire burned through his sinews that his mates might live.

"I'd have had a chance to jump, like Sammy, if I hadn't stopped to rag him!"

The strange fates who order railroad wrecks and their fatalities had reserved Rufus Choate Aspinwall for some further activities. He was three months in the hospital at Alton, for the first of which none knew whether he would live or die. But the same strength which had been both his undoing and his making, saved him.

When he limped off the local at Longport and up the steps to the little office where Blinky sat behind the cigarette-stained desk, he had a curious hunch to one shoulder and one leg was considerably shorter than the other, and there was a livid scar all up and down that leg.

"Back, eh?" said Blinky. "You're all of a man. Now, I want to know one thing. With the guts to do what you did, why did you let O'Loughlin lick you?"

"That?" Rufe smiled, a twisted smile, a long burn-scar showing the whiter for his laugh. "I'm some strong. Stronger than most men, I reckon. I was stronger than any two down on the farm in Kansas.

"When I was twenty, I got in a fight. I hit a man. He's in the asylum yet. I'd rather have killed him. They let me off it was self-defense. But I've never hit any one since—I'd rather take a licking than have another—idiot—on my mind."

It wasn't Blinky's handshake which paid for the twisted foot and the terrible scars and the hunched shoulder where the hot coals had eaten deep, nor the pay above the scale. Nor was it any demonstration nor present from the crew, for there was none of either—this was the wrecking-crew of Longport, with a reputation to sustain, and Rufe had but sustained it.

But if Rufe were introspective or ever spoke the thoughts within his heart, he would have told you that neither the fierce pain of those trying moments, nor those later three months of silent agony in the white room at the hospital, were too dear a price to pay for O'Loughlin's daily hand on his shoulder as he passed, for Danny Williams's, "Give me th' makin's, Rufe, me bye," or, crowning tribute, Reddy's, "Lend me a hand at this lever, will you, you elephant? *I* can't pull it over."

OLD CAR USED FOR ILLUMINATION.

THE Swiss Federal Railways are using a self-propelled car fitted with an electric generating plant, for use in supplying current for lighting construction or repair work in tunnels, bridges, etc., or for illumination in case of accidents. The car, says *Railway and Engineering Review* was constructed in the locomotive works at Zurich, being rebuilt from an old second-class four-wheeled passenger-car, the frame and springs of which were strengthened, and the body altered so as to form two compartments. One compartment contains the machinery, while the other compartment serves as a storeroom; and there is a large open platform at one end. The electric machinery consists of a vertical four-cylinder gasoline engine of the automobile type, directly connected to a four-pole, compound wound generator. The engine develops twenty two horse-power at a speed of 800 revolutions per minute, and can use either gasoline or alcohol fuel. The cooling is performed by a centrifugal pump and water circulation, an automobile radiator being mounted in front of the machinery. A fan driven by the engine draws air through the radiator.

Don't open the throttle on the matrimonial division until you get the clear. The other fellow may give you the derail.

Observations of a Country Station-Agent.

BY J. E. SMITH.

No. 54.—Though Freight Clerks Are Many and Diverse in Type, They Are All Indelibly Branded by the Strange Sign of the Purple Nostril.

N any miscellaneous assortment of railroad men, all the old conductors who broke in during the good old deadwood bumper days, are marked and can be sorted out and rounded up by the sign of the missing thumb or finger, or some other distinguishing mark on the hand the result of an ugly wound or bad surgery

The coming generation of new conductors will be without these gruesome symbols, as safety devices have largely eliminated the steady contribution of thumbs, fingers, and hands, to the cause of transportation.

The next great body of railroad men, bearing the badge or mark of their calling, is the clerks—the common railroad clerk of which there are so many thousands, and all branded. They carry the trace and the imprint of the railroad office. They are stamped and characterized. They haven't parted with a digit or any other fragment of the human machinery, but a close inspection will reveal in each of them a trace of purple about the nostrils.

Hold now one moment. Be not suddenly alarmed. Purple nostrils do not always indicate valvular insufficiency or a lack of red corpuscles from poor oxygenation. The purple nostril is not a sign of physical weakness.

It's the indelible pencil.

And I am here to suggest to that most worthy and growing order of American Railroad Clerks, that the official badge, or escutcheon, sign, symbol or token of membership be the purple splotch under the nostrils.

Elucidating a little further.

The indelible pencil is part of the necessary equipment of every railroad clerk. When he sharpens it, minute particles of dust from the end are inhaled by him. If his lip is moist, enough adheres, for a purple stain—and there you are, inexpensively and artistically embossed with the dye of the order in fast colors.

If a clerk wears a mustache, all the better. A moist mustache and an indelible pencil make a combination that is hard to beat. The little violet and the clematis revel in purple, but they are modest compared with the whole-hedge, storm-on-the-sea effect of a purple mustache. Take any set of features from pale cast to livid, and any combination of hair from the lurid red to the ivory pate, and the purple mustache matches, symbolizes and signifies.

So, for the color of our order let it be purple, commemorative of the pencil, indicating the duty of writing, and so easily applied.

Hold the pencil closely before you,

Series began in the July, 1907, Railroad Man's Magazine. Back numbers for sale at this office.

Sharpen leisurely. Think of your wrongs. This will lead you to breathe heavily, and around your nostrils a little purple stain will develop and smear itself. Then tag! You're it! You belong. You can be picked out and classified. You are a railroad clerk

Having tagged the railroad clerk so he can be easily identified, the next thing to say of him is that he is the least migratory of all railroad employees. He may advance some in duty and salary, but usually that means he only changes desks within the same walls. Thousands of them start, pass their generation and stop under one roof.

There is no particular tragedy in this circumstance. They have always had shelter and food, a certain sense of security and some outside activities.

The typical clerk is often alluded to as an elderly man bent over a desk and spectacled. In pictures he is drawn thin and submissive, rubbing his hands together in docile subserviency and with eyebrows lifted in expectancy. Not for a raise in salary! No, no, little Artemus. What made you ask that foolish question? He is in an attitude of humble obedience, awaiting an order or a call, a nod or a beck.

Clerks of this character may abound. They may—but I have never met one of them. Frankly, I have been in close range with many of them who can cock a foot on a desk, blow a ring and mentally suggest for the whole system

I have seen them by bunches with no more reverence for authority than a Southern delegate has for the noble cause of insurgency. And it does not matter. It is to their credit. Who wants to be thought of as spineless? Who wants to be pictured as tame and tractable and always harking to "his master's voice"?

The old clerk—as pictured, understand—bent, helpless and dependent, mute and hopeless, makes up a pathetic portrayal of life without purpose, energy, talent or self-direction.

Let him exist in pictures and fiction! Far be it from my sacrilegious pen to divest him of the charm of humility and servility and the master poise of obsequious attention. But when I think in terms of railroad clerks, those that I have met and actually known, pass before me as a fragment of a long procession. I cannot help but think that all who have gone before, and all who follow, are of the same type.

I see Walter, the car clerk, daubed "Walt" in familiar brevity. There is no stretch of imagination that calls for our sympathy. There are no extenuating circumstances.

"Walt" is wilfully and purposely a car clerk. He would not be anything else if he could help it. His mind does not scintillate with ideas, nor burden itself with philosophy, but it has the photographic faculty of retaining the picture of car numbers and initials that may flash upon its canvas.

I am not quoting any chapters in psychology, and this hasn't the authority of science; but now and then you find a clerk with a mental quality that will amaze you.

Now, Walt can go down a string of box cars without pencil or paper, give a look, stop on the way back, and exchange a few pleasantries with the crossing watchman, saunter along up to the office and write all the numbers and initials from memory and have them correct

For another example, take the writer. If he wants a car number, and has no means at hand for recording it, he must need repeat it aloud and remember the sound of his voice. The numbers of two cars would be entirely out of the question for him, and any intervening digression would entirely unloose his mental holt and leave him as blank of car numbers as an Eskimo.

I questioned Walt as to how he turned the trick

"Dun no," he answered.

But I did learn this:

When Walt looks at words and numbers they imprint their pictures. They photograph. A little later he can look at the photo and write out what he sees without putting forth the slightest mental effort. Reverting to my own case once more, I must come lumbering up the track under the handicap and burden of one number, of four, five or six figures with only the precarious holt of the sound in my ears that the combination of numerals make, avoiding everything until I can seize a pencil and write it out from what is recorded in the air.

One minute later I could not reproduce it if the fate of the nation hung upon it. I am mechanically deficient. They left out the photographic plate.

I know another railroad clerk who, while poor of memory for abstract numbers, never makes memorandum of dates, for any date once before him fixes itself indelibly.

Walter, come forward again! Pause a moment. Good people, this is no "Punch and Judy" show. We are not introducing a manikin. Nor are we interlocutor with Walter on the end loaded with humorous sallies. We want to exhibit a real railroad clerk, nothing more.

"Walter, what is old Doc Crandal's batting average?"

It takes a forty-foot shelf to hold the volumes on mental phenomena, and any one interested is "respectively referred," as they so neatly put it in railroad correspondence when they want your explanation of something you cannot explain.

I am, however, quite sure that readers of this magazine would find interest in the stories of the mental capacities of some clerks to reproduce from memory car numbers taken at random. Many are beyond credulity. Let them come.

But returning to the lowly clerk

"Three hundred and sixty"

"Where was he born?"

"Wadena, Indiana. In the heart of the oats belt."

"Tell us something of your country's history, Walter."

"Li'l' Artha still remains the greatest of them all. That Jeffries set-to at Reno was only a joke. What did Jim Flinn do down at Las Vegas? A few billy-goat butts and—biff! nothing more to it. And look at Bill Bryan at Baltimore. See how he put all the wise ones away on ice. Observe what we did to

'em at the Olympic at Stockholm last summer."

Now, Walter can run five reels and not repeat. But sufficient to show that he does not bend at his desk all his hours muttering, "two by two are four."

Walter is alive. He is a clerk. Some day he will be an old clerk. But he will never be like those pictures of old clerks

Clerks are not all like Walt. Clarence, the record clerk, is intellectual. That is, he fancies he is, which is much the same thing. Clarence assumes a higher line of thought than Walt

Clarence is the clerk on whom the canvasser fixes an eye when he leans over the counter and sweeps the office force for his prey.

GRUDGINGLY AND UNDER PROTEST, ARCHIE HELPED TO MOVE THE CONSIGNMENT OF BEER

Not in a thousand years. In the end you will find him rolling 'em or at a ward meeting, or with the sporting page, or with a pipe that bites like a wasp.

Clerks have all the bents and idiosyncrasies of common humanity. We have the dullards and the capable, the fit and the unfit. They come good, bad, indifferent and fair to middling. They sift out and gradually adjust and find the places for which they are usually best qualified.

Usually, I say. We have no such thing as exact justice and perfect alinement in any arrangement of men ever devised.

Something in Clarence's open face leads them to him. Clarence puts his name down for E. P. Roe, Balzac, Molière, Hugo or Tolstoy, or whatever fiction, history, biography or philosophy they may place before him. He is accumulating all the classics on the monthly instalment plan.

Clarence will always be paying out, and, in the end, he will have accumulated a great quantity of junk, the greater part of which he will never use or need.

Clarence pays for his household effects on this plan. Ditto insurance. No doubt, all the passions of his bosom are

piecemealed in monthly driblets. There is a monthly turn to all his office work. Clarence is a real wheel with thirty-one cogs, and with every day the same click Bound with regular, recurring obligations.

Clarence cannot be anything else but mechanical. He is of the type, with obligations always ahead, that nearest fills the spirit of the "old clerk" picture.

Then we have the serious clerk, the frivolous clerk, the underpaid clerk, the overworked clerk, the disgruntled clerk, the misplaced clerk, the one whose proper place is general manager, but who is conspired against by fate and held down to an office desk. We also have the singing clerk, the talking clerk, the cursing clerk, the abstemious clerk, and the "booze histing" clerk. There is no end.

Then there is the absent minded clerk who wrote of the death of his father and how he had suffered in his late illness, but had been called to that bourn from which no one returns. Then he dropped a tear on the sheet and added, "Please trace and show delivery."

Then we have the story of the dignified clerk whom they made cashier in the local freight office. He was proud and haughty of the title and attached it to his name with ample shade and heavy sweep in adornment and honor.

He planned a trip and laid off. He applied for a pass over a foreign line The day of departure arrived. The suitcase was packed with the extra changes and all the preliminaries were completed.

The last train brought the pass. Vacation passes are always held for the last train, so the vacator will undergo a period of squirm and sweat before the sudden plunge into the joy of doing nothing and seeing things.

No man's pleasure should work out without a hitch. So with a railroader He goes about and makes all arrangements and every appointment. Train after train arrives, but no passes. Already unnerved by the details of preparation, he goes into a final frenzy, when the pass comes on the last train, just thirty-seven minutes before the train he had planned to take is due.

This was the exact experience of Thomas Wiggers, the dignified cashier. They were all ready. Little Sophia had on her linen suit when the long looked-for letter came. Thomas extracted the slip therefrom and read the words written thereon; but his face darkened and a shadow fell over the household

"Look at this, Martha," he hissed. "See how they got this: 'Thomas Wiggers, clerk.' Clerk! Clerk! Martha. Clerk instead of cashier! When it should read: 'Thomas Wiggers, cashier!'"

"Oh, well, Tom," argued his wife propitiatingly, "it doesn't really matter. We can use it anyway, and we are all ready."

"But it reads 'clerk!'" yelled Thomas, tapping the offending slip with his finger. "'Thomas Wiggers, clerk!' It's an insult!"

His wife could not see the infamy of it, but every time the cashier's eye lit on "Thomas Wiggers, clerk," the gage showed a little more pressure until the outrage was too much

He sent it back. He indicated the distinction between the titles "clerk" and "cashier," and he asked that the necessary correction be made on the face of the pass so that it would betoken to all who had occasion to look at it, that the holder, Thomas Wiggers, was not a common clerk, but a cashier—a man trusted with corporate funds, a man of commission, credit, and confidence.

The wife threw a number of things about with a bang, and little Sophia whined in disappointment, but Thomas, posing with one hand in his bosom, felt that he had upheld the dignity of his position and maintained the honor of his title.

Thomas did not propose to go out into the world, in strange parts, among the unknown, branded as a clerk, when, in reality, he was a cashier

In time the pass came back and read: "Cashier." But the greater part of Tom's two weeks had expired, so they went out in the country to Mrs. Tom's aunt, and remained over Sunday.

Monday, Thomas was back to his desk, cashiering, with the unused pass in his pocket, but with his pride unsullied and his honored name unscathed.

Then there is the highly conscientious clerk with fine drawn scruples and sensitive righteousness.

Archibald was one of these.

He had ideas of Christian duties that related to all his acts. Archie was new,

and when the freight office handled a cargo of beer Archie demurred on the ground that it made him *particeps-criminis* with demon rum.

Archie was commanded to heave-to and lend a hand, but he did it grudgingly and under protest.

That evening he consulted his pastor. Next day he wrote a letter to the railroad head, outlining his fine sense of religious duty and defining his hair-trigger scruples.

He got his answer which was to the general effect that if it came in the course of his duty to way-bill beer or make expense bills or any other office record of beer, or roll the barrels containing beer, or deliver beer to a thirsty patron or a waiting drayman, or to receive beer for some distant thirst, or in any way handle beer as indicated by the rules of transportation, Archie was to lend a hand with alacrity and cheerfulness.

Beer was a recognized article of commerce which a common carrier could not eliminate.

Archie had one of those Jean Valjean struggles with his conscience, and in the first round he was evidently outpointed, for he stuck, accepting his fate rather than be a martyr out of a job.

Then there is the solemn clerk to whom all life is serious and who feels the gravity and importance of his place.

Augustus was one of these.

For twenty years he has been in one place. He is uncomplaining, helpful, and is beloved by his fellows. In his work he is painfully exact and punctilious. He is slow, but extremely careful, and everything that is done by him is done right.

Augustus knows every angle of his department. He knows where every blank is, just where the blotter goes, just how the pen reposes in the wire-holder, just how the pencil lies, so that when he picks it up it will point right without an extra movement to adjust it.

Every Wednesday morning at 7.30 (not 7.29 or 7.31, but 7.30), he cleans the ink-well and refills with a week's supply measured to the drop. He reports for duty and lunches at 12 M. with scrupulous precision. On the street where he lives they set clocks by him as he goes and comes.

For twenty years Augustus never missed a day. For twenty years he was faithfully and constantly on the job. Other clerks came and went, some flashed and some foozled, but Augustus remained steadily on duty without thrill or variation through all the years.

In the meantime he became the dependence of the office. He was the quiet, plodding pack-horse. He bore the burdens, he heard all the troubles of the other clerks, and he was always helpful to them in counsel and knowledge.

Augustus had never taken a vacation. Some one in the office suggested that he lay off two weeks and lose himself in the woods or at the lake, or go to the city, the sea-shore or otherwise spice his existence with some brief diversion. All with one accord urged him.

Augustus backed off in alarm. What would become of the organization—aye, what would happen to the system if he, Augustus, should release hand holts for even the brief period of one fortnight? It startled him to think of it.

Who could keep the record as he kept it? Who was there who could give all the little details the watchful attention he gave them? Who was there to take his place who would not overlook something, fail in some instance, blunder at some point and bring confusion and disaster?

Others might disport in holiday madness, in periods of irresponsible and wanton revel, but he would hold steady.

Still, the others urged and picked a place for him to go and appointed the day, the very hour, when Augustus was to walk out unburdened of every responsibility. He permitted the arrangements to be made. He let them adjust the work and dispose of him. He viewed it all with the resignation of a stoic.

It was his last afternoon in the office. To-morrow morning he was to go hence. For twenty years he had never missed a day from his accustomed place, but old ties were breaking. It was a sad afternoon for Augustus.

He closed his record book in the evening, put his blotter and pen and pencil in their places with devotional care and tenderness.

Then, with grave face, and with something of a choke in the throat, he bid

them all good-by, each member of the force in turn, lingering a little with words of caution and admonition, trying to be cheerful under the solemn ordeal of leave-taking.

In passing out he waved a serious hand to all. The occasion was almost sacredly formal.

confused and confounded while he was standing by, a miserable idler

He felt a nausea at the pit of the stomach. Well toward peep of day a strong purpose took possession of him.

One way was open to avert all disaster. Augustus made for it. He was the first man at the office. The others

HE CLOSED HIS BOOK AND PUT HIS BLOTTER AND PEN AND PENCIL IN THEIR PLACES WITH DEVOTIONAL REVERENCE.

J. NORMAN LYND.

"Well, wouldn't that crimp you?" bluttered the new clerk when the door closed. "Did you ever see a slave take a little liberty like that?"

"If he don't want to use it," added the next newest clerk, "why don't he hand it over to you and me, eh, boy? We wouldn't hesitate to walk out, would we, old scout? And, believe me, none of these precious seconds would be lost shaking hands with the rest of you dolts. At the given second there would be a trail of smoke at the exit, nothing more."

"Augustus is very conscientious about his work," put in the Old Man with mild suggestion.

For Augustus the night was heavy and long. He never closed an eye. What if they should fail to do this or neglect that, or make a wrong entry or miscalculate? What if they should bungle the records so he could not straighten them out? What if everything should become

dropping in one by one a little later found him with black sleevelets on, engrossed in his daily routine.

We do not recall, but we take it that the stock of the road was up a few points on exchange that day, on confidence of stability of operation. However that may be, the fact remains that the steady old pilot had returned to the wheel

"I couldn't do it," explained Augustus. "No one else knows the work exactly and something might go wrong. And why do I want to go out and loaf around for two weeks?"

The new clerk could not understand it. He looked upon Augustus as a strange new creature in this world of frivolity. A sudden fear seized him. What if he should work twenty years and become that way? But the next clerk above him counseled him to have no fears. It was not contagious.

Statistics show that only one clerk in every six hundred and twenty-two thousand get so careful and conscientious in their duties that they will never duck.

In the meantime Augustus was happy at work. Pause a moment and grasp that. Happy at work. Well! Well! Isn't that a state of mind for you?

There is still another type of clerk: One who lingers long at one thing and loses both the perspective and retrospective, together with all present proportions.

At an Eastern seaboard terminal of one of our great railroads there is a clerk to whom come all the way-bills for export grain

The road he works for sprawls westward over the Ohio Valley, with its western termini at Cincinnati, Louisville, St. Louis, Effner, and Chicago.

Every day for years way-bills passed before him from these five cities. From school days and newspaper reading he had picked up some general idea of four of them; but he did not recall that he had ever learned anything about Effner. To him it was a city of mystery. It must be an important city or his road would not make it one of its western terminal points. Through it passed a great business. The way-bills told him that

This clerk married, and he had sufficient from what he had saved for a honeymoon trip over his road to one of the western termini and back.

He chose the city of Effner, because it would reveal the strangeness of the unknown. Every one knows something of the general characteristics of Cincinnati, Louisville, St. Louis, and Chicago No one knew anything about Effner.

The clerk would have something different to tell when he returned. He might have learned something himself

THE NEW BRIDE CLUNG CLOSELY AND LOOKED TIMOROUSLY AT THE LONESOME CITY OF EFFNER

from the guides in his office, but he was so busy holding her hands and looking into her eyes, when not handling way-bills, that he overlooked the guides.

He took a through train, and did not change until they reached Logansport, Indiana, when they passed him over to a branch line which ran sixty-one miles due west into a corn-field and the Illinois State line. That was the city of Effner.

He alighted in a dismal rain.

There was no confusion of traffic, no street-cars, no buildings. A few idling yokels loitered under the eaves of the depot roof. The new bride clung closely to the groom and looked timorously about her.

"In what direction is the city?" asked the export clerk of the agent who came out to meet the train.

"City," exclaimed the agent, tilting his head to get the correct focus. "Stranger, the keys are yours, but there isn't any city."

"A hotel?"

"Well, that old barn of a building was a hotel, but it's closed now."

"Don't anybody live here?"

"Not on this side of the track, but there's four families on the other side."

"When's the next train back?"

"At five-thirty in the morning."

There was a whispered consultation between groom and bride.

"Isn't this Effner?"

"Sure thing. See the sign there?"

The bride and groom were momentarily dazed. They looked about them helplessly, then exchanged whispers.

"Will you show us some place where we can remain overnight?"

"I don't think there is any place you can stay," explained the agent. "Mrs. Stone over there has two rooms, but the railroad men occupy them. We might explain to them and maybe they will let you have one of them."

"I do not want to go over there with those horrid men," protested the bride, cuddling closer to the groom for whatsoever protection was necessary. "Can't we remain in the depot?"

"You may if you prefer," replied the agent. "We have a folding cot in the office. You are welcome to use that."

They accepted the offer. During a long night the bride reposed in fitful comfort and the groom sat up in that giddy, hair-raising pastime of watching the hour-hand of his watch race around its crystal enclosure nine times.

At 5.30 A.M. they headed for the East, and they did not avail themselves of any stop-off privileges en route. In other words, they kept going

Let us set Effner straight on the map, so that no growls will emit from that municipality. Another railroad runs from Keokuk through Peoria to Effner, and at Effner turns over many cars of grain to the line that runs from Effner to the Eastern seaboard.

The clerk in the East who handled all this business without looking up from his desk imputed great importance to Effner. All of which shows that one's impressions made up by indirect evidence and suggestion are often wrong. Furthermore, this does not apply solely to the aforesaid export clerk. Our conception of places—and many times of one another—are often faulty, because they come from a single circumstance or some unqualified suggestion.

Lastly, wherever clerks abound, we have the clerk who has a little boy or a little girl at home who is an infant prodigy. Every morning this clerk comes with a new story of little Humbert or what the music-master says of Myrtle. These children are the hypostasis of wit, philosophy, and precocity.

Do not put him aside. Hear him patiently. He may bore you with his persistent and long winded enthusiasm. He may insist in telling you in wealth of detail what he himself said, what uncle said, then the cap-stone remark that little Humbert put in.

He may bore you some about little Myrtle and the piano. How, at twelve, she can play the Fifth Nocturne, and that, by the time she is fifteen, she will have all of Liszt's Hungarian rhapsodies at her finger tips.

Bear with him. He is one of us. There are clerks with little boys and girls at home, and these clerks grow old bending over their desks and denying themselves everything in a life of sacrifice, hoping for a place of honor and triumph for the little ones whom they delight to praise.

There is to be greatness in the next generation. Some of it may come from the little family of the humble clerk.

IN THE PANAMA ZONE.

Railroading on the Isthmus Offers Many Advantages, But Thievery and the Peculiar Treachery of the Climate Usually Drive Men Back to the States.

BY H. D. BALDWIN.

HAVING been induced by a friend to apply for employment with the Panama Railroad a few years ago, I received notice to call at its office in New York, where I filled out an application and received my appointment. Armed with a letter to the general manager in Colon and my ticket, I landed on the isthmus after a seven-day voyage on one of the steamers operated by the same company.

I had previously received a pamphlet, printed and issued by the Isthmian Canal Commission in Washington, which stated the conditions of employment, rates of wages, and other inducements offered to employees in the canal zone service

Most men hired in the States by the Panama Railroad are paid on a monthly basis in American money, or gold, as it is called in distinction from the Panamanian currency, which is called silver, and is worth only half as much as our silver money.

Free quarters are provided for all white employees, both of the railroad and I. C. C., which also operates about 170 miles of track and 250 French and American locomotives of its own.

Major George W. Goethals is chief engineer of the commission and president of the railroad, which cooperate. The management is distinct, however, and the railroad continues to handle its freight and passenger-trains and employ its men much as it did before the government acquired control The railroad does not observe the eight-hour day as the I. C. C. does, or pay its men quite so well, and unlike the I. C. C. still employs many foreigners.

All "gold" employees on the Isthmus are entitled to free hospital and medical attendance and medicine. Their wages are paid during illnesses not exceeding several weeks in duration, and the men are paid indefinitely if injured in the service

They receive an annual vacation of six weeks unless hired on an hourly basis, in which case only two weeks is allowed in view of the fact that hourly men are paid liberally for overtime.

The men are given a pass for a round trip between Colon and Panama once a month. They can buy additional tickets at half rates, and are also allowed a special rate when traveling to and from New York on their vacations or on leaving the service, if in good standing

Prices Lower Than Ours.

They send their cablegrams at half price, receive light, drinking water and the *Canal Record* free. After ten months' service they may bring their families to the Isthmus and maintain homes in free married quarters, which are furnished and supplied with fuel.

Ice, groceries, bedding, and clothing must be bought. Commissary stores are conducted by the government at most of the towns along the line.

These stores are simply department stores handling almost everything at

prices lower than those in the States, for the government adds but about ten per cent to the cost. No money changes hands in these stores, as the employee pays for his purchases with coupons torn from his commissary book, the cost of which has been deducted from his next pay.

As these books are not transferable, no goods can be purchased save by an employee, nor can one sell such goods without violating the rules. This applies to meal books on which the single men eat at the government mess halls, or so-called hotels; one or more of which are operated at each town and camp along the line. The meal books cost fifteen dollars and contain fifty coupons, each good for a thirty-cent meal at any eating-house on the road.

The meals are served between certain hours three times a day. Most of the colored cooks and waiters come from Jamaica. In some of the larger places like Cristobal, Gatun, Gorgona, Empire, and Culebra, and also at the only real hotel, the Tivoli, at Ancon near Panama, one can obtain service *à la carte*, but a book will be sadly depleted, as the prices are very high.

In most of the places he will not recognize the dish he ordered when it arrives on the table, for it is usually spoiled by the Jamaican who cooked it, but must be paid for just the same.

Meals and Service Unsatisfactory.

At the house in Colon, where most of the white enginemen, conductors, and clerks board, the table is much better. The Tivoli, being a hotel, is in a class by itself. Aside from these places the food is usually rather unsatisfactory, although some of it is always good. The average West Indian negro is not a good cook.

Many of the men prefer to eat their breakfast in the Chinese lunch counters, where one sits on a box or bench and for ten cents in gold standard is given a French roll spread with canned marmalade and a cup of tea or cocoa. The coffee on the Isthmus is never fit to drink -why I never could find out.

The Chinese places, however, are extremely dirty. The butter is always very soft, and one must examine every mouthful of food to see that it is free from the ants which swarm everywhere The bread is excellent.

From 11 A.M. to 1 P.M., and from 5 to 7 in the evening, the regular dinners are served at the "hotels."

The noon meal is called "breakfast" by the natives and, like the evening dinner, it will probably consist of soup, roast, vegetables, *entrée*, and some inferior ice-cream, and fruit. One tastes of five of perhaps ten of the side dishes and one usually places three of them in the discard.

Government Operates Fine Plants.

In Cristobal on certain days in each week they serve potatoes in a sauce apparently composed of flour mixed with water, such as our bill-posters use. Nobody ever eats any of it, but it is served as regularly as salt mackerel used to be.

The government operates an ice factory and cold storage plant for fresh meat, fruits, and vegetables in Cristobal. There are also a coffee-roasting and ice-cream plant, a steam bakery, and a big laundry, which handles all the linen.

One's washing is paid for with commissary coupons, and is "done up" by colored women, who with steam, electric and alkaline assistance, ruin the fabrics. Each day a colored janitor cleans the rooms

Owing to the extreme dampness of the air, clothes will not dry, and soon grow moldy if not placed in a box or closet in which some electric bulbs are left burning all the time. Mildew develops on everything that is not aired daily, especially during the rainy season, when heavy showers fall every few minutes. It is a common occurrence for several inches of water to fall in an hour; it has been known to rain over six inches within one and a half hours. The Chagres River has risen forty feet and overflowed the railroad in a night. Trains have often crossed with the tracks a foot or more under water during one of these floods.

The main events of the week are the arrival and departure of the New York boat. It reminds one of a Western town when the through train pulls in.

A newcomer usually brings the wrong

outfit and too large an outfit for his comfort.

In the first place, a man cannot bring his family with him at first, as he cannot obtain quarters for a long time. He is usually given a bed in a room with one or two others. He must buy sheets and pillows. A man moving into married quarters need not buy furniture unless he wants more elaborate goods than the plain, cheap mission stuff which is supplied.

If he is foolish enough to bring a trunk and any heavy or woolen clothes, it is soon a mass of mildew. All that a man requires is light clothes.

As he receives a week's pay for the time spent on the steamer, he does not need any money. He receives a meal book and buys what he wants on credit till pay-day.

The climate is rather pleasant and most of the men have been healthy since sanitation was improved. Nevertheless there is something treacherous in the atmosphere there that cannot be explained to one who has not lived there, and sooner or later all feel it. Man after man who held an important position has dropped from view, to be followed shortly by his successor.

Should a workman have cause for complaint, he may as well forget it there, as an ordinary lifetime would be required to penetrate the red tape that surrounds the officials.

The place swarms with gum-shoe men, adventurers, and crooks. Every worker is constantly wondering when he will be tricked, and despite the advantages he begins to long for the time when he will return to his home.

LOW PRESSURE CYLINDERS ON TENDER.

A LOCOMOTIVE has been designed which is practically an ordinary Mallet with working tender, but instead of having the high and low-pressure cylinders of different size, has a pair of high-pressure cylinders attached to the frames connected with the back part of the boiler, and two pairs of low pressure cylinders, one at the front and one at the rear of the tender, all of the cylinders, both high and low pressure, being of the same size

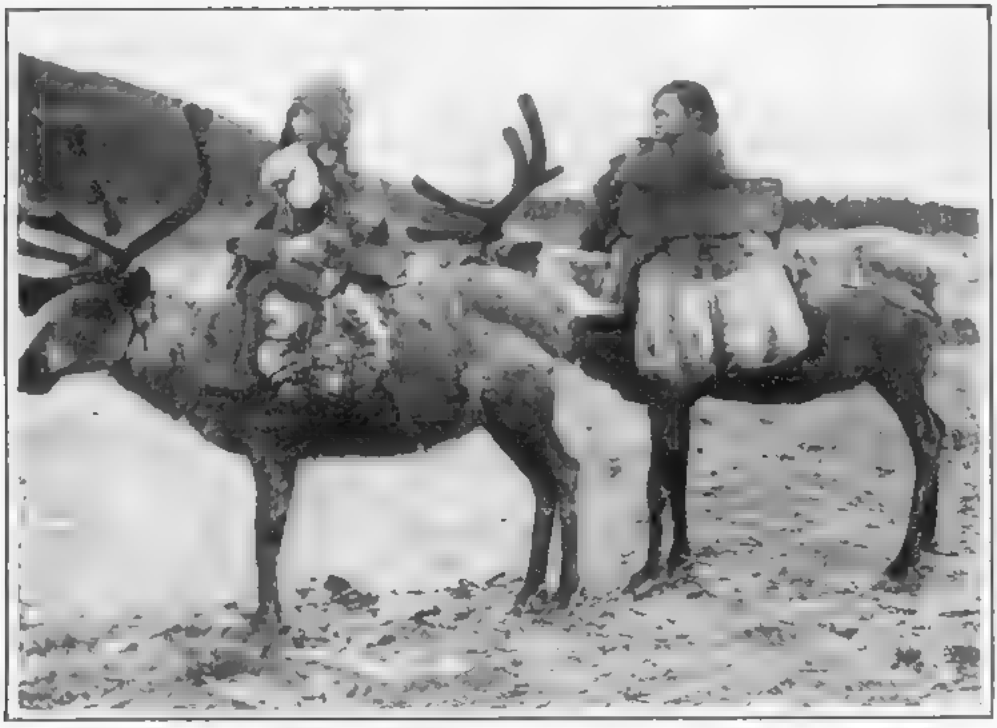
With this arrangement a compounding ratio of two to one is obtained, and it is found that, with but a slight increase in the weight and cost, and without any increase in length, about fifty per cent more tractive-effort is obtained, the working tender being so arranged that, with only twenty-five per cent of fuel and water remaining, there will be sufficient weight to give the full adhesion

The horizontal pipe with a ball-joint in the cylinder-saddle, which takes the exhaust from the high-pressure cylinder, has, according to the *Railway Gazette*, given practically no trouble in Mallets now in service, and this is simply duplicated in the rear of the new design by making a pocket with a ball joint in the foot-plate and taking the exhaust steam from the high-pressure cylinders back to this foot plate, as well as forward to the front cylinders.

The object of placing the cylinders on the tender at the rear end, is to make the swivel-pipe, which has the ball joint in the foot-plate and which corresponds to the receiver pipe, connecting the high and low-pressure cylinders at the front of the engine, of suitable length.

USE COPPER TO IMPROVE RAILS.

WHILE copper has never entered into the manufacture of steel rails in this country, there now seems a probability that it will do so. In that event, it will create a new demand for more than 100,000,000 pounds of copper annually Recently the engineers of the New Haven Railroad investigated the history of about six miles of track that had far outlived the ordinary life and usefulness of the average steel rail. They found that the section of track was laid with rails imported from Glasgow, Scotland. Analysis of the rails showed that, in distinction from the ordinary type of steel rail, they contained about 1½ per cent of copper. Many of the steel mills now have orders for the manufacture of rails containing this amount of copper, and this metal is likely to be more generally used in the manufacture of rails.



THESE CHILDREN, THE ELDEST A SEVEN-YEAR OLD BOY, RODE THE REINDEER UNACCOMPANIED, ONE HUNDRED MILES OVER THE SIBERIAN WILDS PACKING THOUSANDS OF DOLLARS' WORTH OF VALUABLE FURS.

THE NORTH POLE FAST FREIGHT LINE.

Its Equipment Is Reindeer and Dogs, Whose Tracks Are Always Covered with Snow and Its Crews Are Frequently Little Children.

BY WALTER L. BEASLEY.

AMONG the most picturesque and least known of all men engaged in transportation are the nomadic inhabitants of Arctic Siberia. Thousands of miles from civilization, in a trackless and most inhospitable region where the steam engine and railroad car cannot penetrate, they are literally the "transportation crew of the top of the world."

With their dog and reindeer teams these brave and venturesome freighters of the frozen world play an important rôle in the world's commercial life. For it is their primitive sledges that transport highly prized furs from the isolated hunting regions.

A FREIGHT STATION IN SIBERIA. THE HUTS ARE THE CRUDE WAREHOUSES FOR FURS

It is not generally known that Siberia furnishes a large quantity of ivory to the markets of the world, but the production of it belongs to another age and to a species of animals that do not now exist. The ivory is cut from the tusks

REINDEER FREIGHT TRAIN STARTING ON ITS SOUTHERN JOURNEY.

of mammoths whose skeletons are found frozen in masses of ice or buried in the mud of arctic rivers and swamps. The northern portion of the country abounds in extensive bogs. In these are found the tusks of the mammoths that perished thousands of years ago.

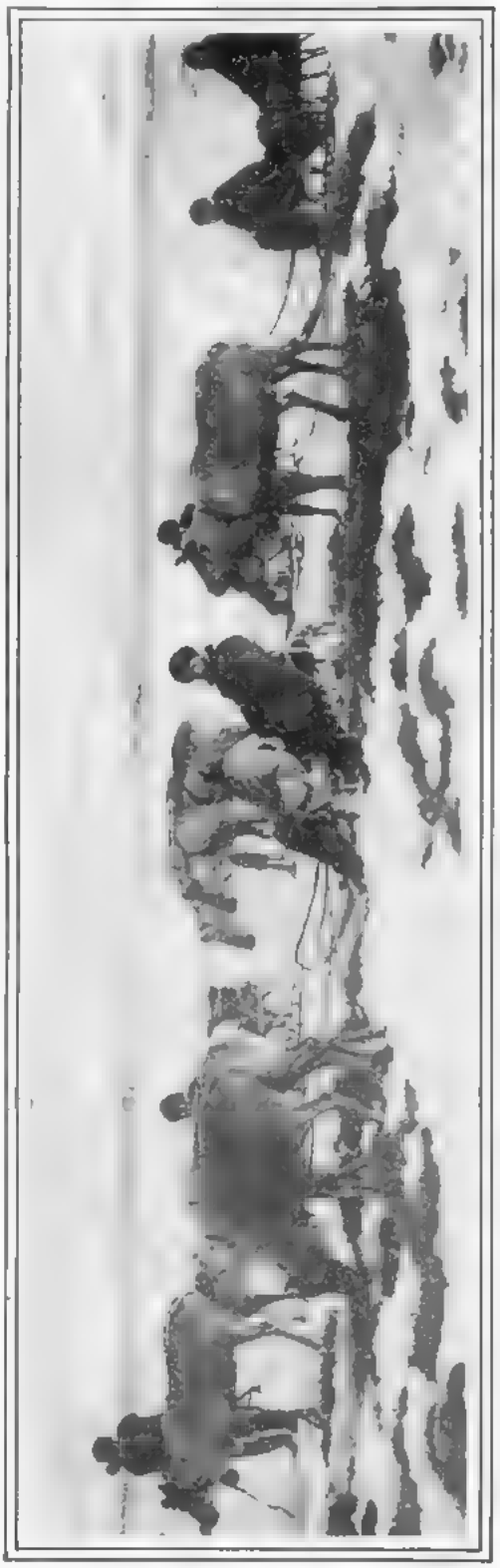
Even to wild animals these bogs are forbidden ground. The nimble reindeer can sometimes cross them safely in the summer, but most other large animals would be engulfed. When the summer thaw that penetrates more deeply than usual into the ground, some of these antediluvian monsters are always exposed.

It is to recover these valuable fossil tusks, also to hunt and trap the fur-bearing animals and transport the pelts of the sable, ermine, sea-otter back to civilization, that forms a chief occupation of many of the Siberian natives. They make the longest and most perilous freighting journeys in the world, beset by all sorts of hardships.

The people are divided into two classes, the reindeer-breeding and the dog-breeding tribes. The former live entirely on the products of their reindeer herds. Some of the reindeer tribes use their animals for riding and sledge driving only, and not for food purposes. The Yakuts, one of the largest and most progressive tribes, use their deer entirely for transportation purposes.

Two large animals are always used to a freight sledge. These carry merchandise, mail, and furs all over the northern part of the province of Yakutsk. Their reindeer are of great size, larger than those possessed by the other reindeer people.

If well pastured and not overworked a trained pair of harnessed reindeer can make fifty to seventy-five miles a day, provided that the snow is thin and hard on the tundra. When tired the deer must be immediately rested. If compelled to travel further they become exhausted and often drop dead.



THE ONLY FOOD FOR THE REINDEER ON THE LONG JOURNEYS IS A GREEN MOSS WHICH GROWS ON THE ROCKY GROUND. AS THE PHOTOGRAPH SHOWS THE SNOW MUST BE SCRAPED AWAY BEFORE THE ANIMALS CAN GRAZE

THIS ARCTIC WOMAN HAS BEEN A FREIGHT CARRIER IN THE FROZEN COUNTRY FOR YEARS. SHE IS RIDING A DEER SPECIALLY BRED FOR EXPRESS SERVICE

They feed on the moss which grows throughout the year in the tundra. When the ground is covered with snow they scrape the snow with the hoofs of their forefoot, the sharp rims and pointed ends of which penetrate the snow, even when covered with a very hard crust.

One of the long sledge journeys made by the inland reindeer people is over five hundred miles, in March and April, when they make up a trading caravan of reindeer skins for boots and clothing, etc., which they take to East Cape on the Pacific to barter to Americans and whalers.

Quite a few of the enterprising natives cross Bering Strait and accompany the whalers to St. Michaels or to Cape Nome, carrying loads of reindeer skins, which are sold chiefly to the white people.

It was from these nomads of Northern Asia that the United States Government bought the reindeer which have been so successfully domesticated in Alaska and proved of great benefit by furnishing a means of subsistence to the native Eskimo.

Many of the natives who make long fur hunting trips and expeditions to the distant arctic shores for ivory tusks, use their remarkable trained dog teams. Accustomed to the coldest and severest of weather, with marvelous powers of endurance, they are considered the swiftest, strongest, and most tireless little animals in the world.

The principal and most intelligent member of the dog team is the leader, as the speed and guidance of the team depends on him. This animal receives special training

Sometimes the female is attached in front, and her whole litter of pups in the rear. In a few months, when the pups are quite grown, such a team will perform heavier and more uniform work than any other

The team-dogs serve till ten or twelve years old. After the sixth or seventh year they begin to decline.

The dogs are harnessed in pairs to a strong seal thong which serves the place of a whiffletree. A full team consists of six or seven pairs.

The course is directed by special call words. These are understood and obeyed by the leading dog, which is trained especially for that purpose. The harness consists of a breast-piece and two or three bands across the back.

The dogs pull on the traces somewhat obliquely, so as to leave sufficient room between them to avoid jostling. Even when a young or badly trained dog is matched to an old one, the elder will actually prevent its companion from causing trouble, biting it severely every time it tries to leap across the strap.

Shy or disobedient dogs are placed nearer to the sledge, where they can be reached by the whip.

At the rear more exertion is required, since the sledge, on every undulation of the ground, pulls backward. Strong animals, somewhat slow from age or from lack of mettle, are usually placed at the rear, and those that are more brisk, in the front.

With a light sledge and good dogs, a hundred and fifty miles can be traveled in twenty-three hours. Two hundred miles have been made in two days.

The dogs are fed once a day, usually in the evening. A piece of blubber about two inches square and some shreds of walrus meat, dried or frozen fish, form the daily ration of every dog

A good team of twelve dogs can haul from four to six hundred pounds.

THE RED-PAINTED SHANTY.

BY J. E. HELMS.

Written for the "Railroad Man's Magazine."

HOW dear to my heart are the old local freight-yards,
When a cold, frosty morning presents them to view;
The coal-cars and box cars and old, broken flat cars,
And every loved dump which the company knew;
The dingy old roundhouse, the storehouse nearby it,
The coal-chutes and rip-track we all know so well,
The yardmaster's office, the air-shack nearby it,
And e'en the red shanty we all love so well
The neat, cozy shanty, the red painted shanty,
The much adorned shanty we all love so well

That red-painted shanty I hail as a treasure,
For often when raining and freezing quite hard,
I found it the source of an exquisite pleasure,
The warmest and cheerfulest place in the yard
How soon after all of the work was completed
We'd rush to the shanty to soak in the heat,
'Twas a pleasure, consoling, a joy everlasting,
Not a place in the yard quite so warm a retreat
As that neat, cozy shanty, that red-painted shanty,
That shanty so cheering 'twas one hard to beat

How sweet come the thoughts of this enjoy it,
Especially so, when it's snowing and cold,
Not a heavenly palace could tempt them to leave it,
Though its roof was of silver, its floor laid with gold.
How sweet comes the thoughts of this shanty so cozy,
As down from the sky come the snow or the rain,
And we'll cherish forever the comfort and pleasure
That ever abound in this railroad domain
The neat, cozy shanty, the red-painted shanty,
The shanty that keeps out the cold and the rain

Frisco Slim Retires.

BY A. HERSCHIN.

There Was Too Much Language on the Map and He Couldn't Stand the Wisenheim Dope.

FOR an instant it was a joyful reunion of Frisco Slim and myself. Then, with a long, lugubrious sigh, he sank back into his seat in Union Square and surrendered to the acute attack of despondency from which my presence had lifted him.

"It's no use, Blondy," he complained bitterly, letting my welcoming hand drop slowly from his hearty grip; "it's no use, competition's the death of trade, 'specially when you're foul of guys with a string of letters tailing up their name like a nest of printer's pi

"Here's what I mean," he hastened to explain, noticing my inquiring glance; "lately the road has been jipped by these college Willies, and their new line of panhandling has dumped us old-timers into the ditch. For myself I can't hold out against it, so I've quit. Pretty tough, too, after all the years I spent getting hep to this stunt of slipping over something easy in the struggle for existence.

"See that last one? They got me doing it! 'Influence of association,' one of 'em called it.

"Y'know, Blondy, they don't call our old bo hangouts 'the jungles,' any more. First of all they knock it by saying it's ungrammatical to prefix—see that!—prefix a plural noun with a singular article By the Lord Jim Crow, that's a mouthful! Besides, they said, it was geographically inaccurate. Yes they did! They tipped it off that jungles are in in indigitus "

"Indigenous," I corrected.

"Huh!" He sat upright and turned a startled face toward me. "You got 'em, too, blamed if you ain't! Funny" he mused, dropping back to his cramped posture of despair, "what a steady job and a little wising up will do to a gink. But you're right indigenous was what they said. Jungles was indigenous to tropical climes and were not to be found in more temperate zones."

He paused and gazed helplessly at the Statue of Naval Victory, which adorns the center of the square. Thus for a long time he remained, lost in the contemplation of a gloomy prospect. Sadly he resumed

"Yes, and that ain't the worst of it.

Imagine you and me in the old days flagging a skirt and slipping a line of gab like this: 'Madam, being temporarily embarrassed financially, I would gratefully appreciate an offering of whatever cold victuals you may have remaining from your previous repast.'

"Honest, Blondy, I'd never swallow it from any one else if I hadn't piped it off myself. Land of Ike, man, suppose you and me went dingbatting that way! Where'd we be? Why, she'd flag the Old Dog Tray, she would. But these here junks can pull it off and land 'em every crack. You and me are too crude that's the word they said we hoy polloes."

"Hoi polloi?" I suggested.

"Uh-huh; hoi polloi are too crude with our mooch spiel. And where we had to put a chalk mark on a horstile dump to tip off the other rodeos, these new rah-rah tourists just pass up the signals; they ain't superstitious, they say. With their wisenheim dope they don't believe in signs. Such things are native only to primitive minds. Can you beat it?

"And they wouldn't stand for no slang, neither. They called it vulgar and said that it was a self-evident confession of linguistic limitations. My map hurts from saying that. They admitted what a froggy named Hugo said: 'that slang was an effort on the part of the untutored lower orders to express themselves,' but in these days of populace eddication there ain't no justif justif no excuse to defile the pure fount of the mother tongue with the rough stuff. They pulled all that on me, they did.

"That was one of the first breaks that ga' me a grouch ag'in' 'em. So you won't hear no more the good old 'batting the main stem,' or 'hitting it up for a light piece,' or 'flopping in a kip,' or nothing like that. Only a raft of two-footers out of a book. Why don't they talk English like you and me? It's fierce and a whole lot more, that's what!

"And there's more coming. These Willie bums are pretty nifty with the writing-stick, and lots of 'em are doping us old scouts out in the magazines. Call their stuff 'The Passing of the Tramp,' or 'The Rehabilitation of the Road,' or 'The Old Order and the New,' and getting real kale for it at that. I read some of their stall, and believe me, Blondy, it's a ringer for the stunts you 'n' me went through. Only with these here zobs they don't live the gaff theirselves so much as lamping how the old timers do it.

"They write about our chatter but never kick in with it theirselves. If they wanta beef about 'huggin the guts of a rattler,' they twist it inta 'embracing the intestines of the limited.' And live after saying it! Where you and me would say 'beating it out,' they come through with 'purloining a passage.' No, with that gab running round without no chaperon the game ain't no use no more. Me for the big tent from now on. I know when I'm canned.

"And the way they travel! You and me would just grab a quilt and blow. But not these flossies. Nix. They all wear khaki suits hot off the clothes press; a little knapsack, and a stick they call a pikestaff. In the kit they got a sleeping bag, a little lavender-colored piller with ribbons onto it, what some flossie gave 'em, I guess; and a bunch of cooking gear like in the army.

"Too good for the old boil-up in the jungles, they are; it's too unsanitary and permisskuss. Then they got a little pack of chocolate what is for emergency rations, and tablets you can make soup and beef-stew and hamburger out of. It's awful!

"And the talk they uncan when they're scoffing their chow. This writer stuff; Gibson and Shawl, and"

"Ibsen and Shaw," I mildly corrected.

"Yair. And Matterlink, and Soodyman, and Louie Toolstore, and Arnold Benedict"

"Tolstoy and Bennett. And, I suppose, also Jack London and O. Henry?"

"Nix, nothing doing. They call them mere prowling tarriers."

"You mean proletarians, don't you?"

"That's it—proletarians. But them two ginks for mine when I want to get jerry to the real junk. Well, these new hundle stiffs don't flop round in the jungles after inhaling their eats like you and me usta do. Instead, they hit inta some library or go over to the court house and annex the lip-fest or chew the fat with the rubes on tariff and dismemberment and irritation.

"Then when the curfew kid comes on

the job they butt into a freight in front of the depot, big and chesty like a town bull. And when the shack blows round for donations for aged and disabled brakemen, the line of gab they peddle to these poor fellows makes me almost pity 'em. When a bo feels that way for a shack you get me that the case is some bad; what?

"Well, the lamp-slingers are only too glad to duck their nut outa the uncongenial environment, as the highbrows say. At first when I steered up against them rummies I was hot and made a pass at one of 'em. When I kicked back to life in a ditch, another bo was fanning me and holding my bean back so's the claret wouldn't paint signs on my rags.

"Gee, but that was a clout in the beezer! I thought I was tapped by a pile-driver; but the bo flashes me a card the white hope left and suffering hand outs! It was the ex-champion shot putter and athletic instructor of a university. Now I'm hep to this higher eddication patter. And I seen another of these Gerties trim a flock of lumberjacks up at Sissons when they kidded him about his make-up.

"He was pinched, but next day in court in the feed room of the grub foundry he was his own lawyer, and he beefed down the rest of the outfit, the Solomon and all. They was glad to let him ramble quick. He made 'em look like a busted coupling. So what are you going to do ag'in' a combination like that—a scrapper and a Blackstone kid?

"And the way they glom the needings for a gump stew! Nothing like the old stunt when you and me just breezed into a hen coop with a club and took chances with Towser or a car-load of pills. No. These A.M.'s and LL. D.'s just pull out a squirt gun, dope it up, and then shoot it into the window at the Shanghais. Then they roll in as easy as making change with a blind man and land a bunch of groggy broilers and beat it for the jungles, what they call the 'rong-day-voo.'

"There they unbuttons the skin and feathers whole and bury 'em. Then they flash a two-gallon pot what doubles up like these here drinking cups you've lamped, and boils up a throw of gow. That's what I seen 'em do. So what're you gonna do with competition like that? They got us spiked to the rail."

"Pretty rocky, all right," was my imbecilic comment, "and I guess you're right in quitting. But don't you feel lonesome now that the old bunch has gone flooey?"

"Yes," he answered mournfully, "I did for a while. But since you're here, and Wisconsin Red runs a dump—"

"What!" My amazement was genuine. "Wisconsin Red has quit, too? Why I thought that old boomer would last forever!"

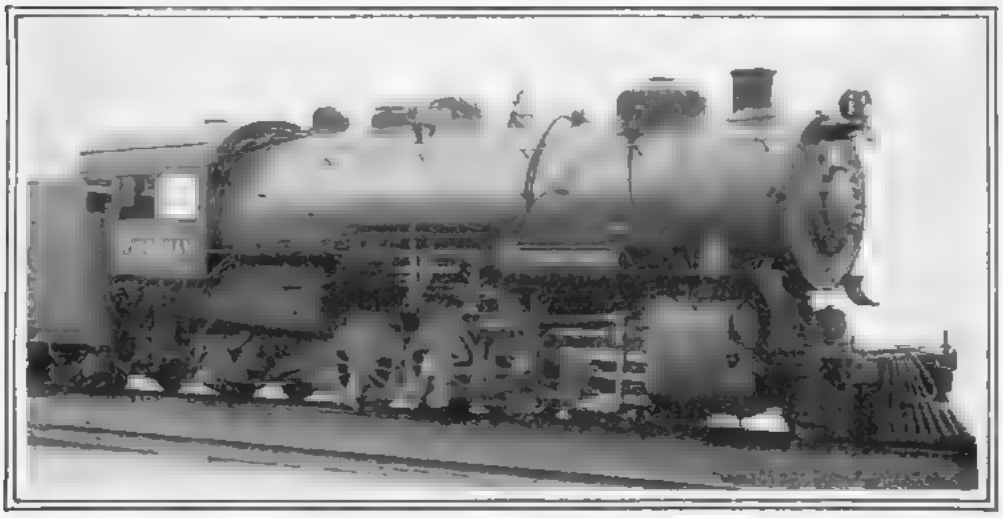
"Yes, he's taken the count, all right. Shows you how rotten it is. Red could gnaw the cloth with any of us common stiffs, but if Red sounded like a book, these new squabs are like a whole dictionary. Come on over with me. Red's handing out the best Mulligan in Frisco for a nickel. And he's our president, too."

"President of what?"

"The Brotherhood of Antiquated Roughnecks," says Slim.

TIP TURNTABLE TO UNLOAD CARS.

A CAR especially designed to elevate and dump cars loaded with coal, gravel, and like materials, is being used in Germany. It comprises a flat car of especially strong construction, on which is mounted a turntable bearing rails. This turntable is capable of being swung completely around and can be tipped to an angle of 45 degrees. Normally it is inclined at an angle of 30 degrees, so as to form an unbroken line with the approaches on which the cars are drawn onto the turntable for unloading and are run from it after the operation. Cables, driven by a motor, draw a car at a time onto the turntable, the turntable is given a quarter turn, its inclination is increased from 30 to 45 degrees, and the load is allowed to discharge from the end of the car. Then the turntable is lowered again to the 30-degree inclination, turned another quarter revolution, and the empty car run off the table on a second set of approach rails. The operation of the turntable is executed by means of a second motor. The idea is to provide each long coal train with an unloading device. It will elevate and unload six to eight cars an hour with ease



THIS POWERFUL NEW FREIGHT HOG HAS 910 SQUARE FEET OF SUPERHEATING SURFACE

MOST POWERFUL MIKADO.

New Type Solves Some Interesting Problems in Locomotives Used for Hauling Heavy Freight.

THE Baldwin Locomotive Works recently completed for the Virginian Railway ten powerful locomotives of the 2-8-2 type, which, because of their capacity and special features embodied, are among the most notable mikados of those constructed to date.

These engines have 26x32 inch cylinders; driving-wheels 56 inches in diameter; grate area 57 square feet, and are designed to operate with 185 pounds per square inch steam pressure. The weight on drivers is 220,600 pounds; total weight, 297,500 pounds, and tractive effort, 60,800 pounds.

The new locomotives show an increase in tractive effort of 21 per cent, and in total equivalent heating surface of 28 per cent over those of similar type built for this road in 1909.

A distinct novelty is noticeable in the construction of the cylinders, which are of vanadium iron: they are cast separate from the saddle. Each cylinder is secured to the saddle by fifty 1¼-inch bolts, and of these, 29 pass through the frame. In addition to this security from working there are three 2½-inch tie-bolts, which are put in place while hot, and, extending across the engine on a line with the top of the frames, thus bind together the cylinders, frames, and saddle.

The advantage of this arrangement is, of course, apparent in the fact that it permits the ready renewal of a cylinder should it be damaged through accident, and practically insures the life of the saddle for the life of the engine. Under the ordinary construction the removal and renewal of a defective cylinder is a lengthy as well as a costly operation, necessitating much dismantling of the locomotive; but in this design, with a reasonable share of good luck and management it might be possible to do it in two or three days.

The new engines are fitted with superheaters, the elements being arranged in forty tubes, which are 5½ inches in diameter and are grouped in four vertical and ten horizontal rows. This is one of the largest superheaters yet applied to a locomotive, having 910 square feet of superheating surface. The brick arch is of the sectional type supported on water tubes, and provision has been made for subsequently applying Street automatic stokers.

These locomotives have the largest eight-wheel tenders ever constructed, the tank capacity being 12,000 gallons. The tender frame sills are fifteen-inch steel channels, and the side sills are 10-inch channels. The tender trucks are of the equalized pedestal type, with 6x11 inch journals. When com-

pared with those previously built for the same road the new engines clearly illustrate the increase in capacity attained in the mikado type during the past three years. The general design is based on that of the earlier locomotives, while the addition of a superheater guarantees increased efficiency.

The mikado type is rapidly supplanting the former popular consolidation, or 2-8-0, for freight work practically all over the country. The addition of the pair of trailing wheels to support the rear end of the boiler permits the fire-box to be greatly increased in grate area with a corresponding improvement in steaming capacity of the boiler.

LAST OF THE WOOD BURNERS.

BY DIXON VAN VALKENBERG.

THOUGH wood-burning locomotives are practically a thing of the past a railroad in the South still uses them to haul its trains.

The first wood burning locomotive to make its appearance in the South was the Mississippi. This locomotive was built in England in 1834. It was still in use in 1890, but its service had not been continuous

It ran between Natchez and Hamburg, Mississippi, in 1836-1838. No record of its service to 1868 is obtainable. In that year it was sent to Vicksburg, where it was soon abandoned and became buried in sand. In 1878, it was overhauled and placed on the Meridian, Brookhaven and Natchez Railroad, where it ran until 1880.

The Mississippi was the first locomotive with a cab, but it is not known whether this was part of the original design or not. The construction shows more modern ideas than were apparent in the other engines of that time.

The introduction of coal on the Southern railroads occurred in about 1881. Then began the passing of the wood-burning engines, but the Pensacola and Atlantic division of the Louisville and Nashville Railroad, between River Junction and Pensacola, Florida, still uses them in passenger and freight service

The wood is supplied by those who live along the line at a stipulated price for a cord. It is hauled by ox teams to the stations and piled on racks. It is either thrown on the tenders of the engines by the train crews, or dumped on the tenders at points where they have what is known as wood-dumps, which resemble in construction the ordinary coal tipple.

Wood was used on the entire Louisville and Nashville line until mines were worked and coal became available. The change from wood to coal was extended from one division to another until the use of wood was abandoned on all but one.

Wood is used on the Atlantic and Pensacola division because it is available and more economical than coal. Coal would have to be hauled from the Alabama coal-fields, a distance of 350 miles, with the added expense of handling and maintaining a coaling station. Eventually, no doubt, coal will have to be used.

The mere fact that a locomotive is equipped with a balloon stack, and because wood is used as fuel, is no indication that the locomotive is antiquated or out of date, notwithstanding that this appears to be the general opinion. As a matter of fact, modern locomotives are sometimes equipped as wood burners for use in isolated points in this country as well as Mexico and South America

CAR BURNS WEEDS ON RIGHT-OF-WAY.

WILBERT W. LAMB, an inventor, who was born in Iowa nearly sixty years ago, realized that if spreading fires and consequent suits for damages were to be prevented, if the property of the railway was not to be constantly sacrificed, grass and weeds must be burned when they were green and not after they had ripened and died, scattering seed all abroad, which was bound to speedily grow again. Therefore, he began to work out an invention from the green-grass view-point, and in the course of the years he has made forty different machines, intended to accomplish this result. He has perfected a machine with burners fourteen inches in diameter, feeding into a set of seven gigantic tubes thirty inches long A big gasoline tank on the back of a car feeds the gasoline to the burners under pressure fed from a pump of 100 pounds to the square inch. This tank holds 1200 gallons of gasoline, and in ordinary operation the burners will eat up 200 gallons of fuel in an hour, with the car running at a speed of eight miles an hour. The heat generated is so enormous that every living thing falling under that fiery breath shrivels and dies. The speed at which the destroying car is drawn prevents heating of the rails.

TRUE STORIES.

Nos. 65 and 66.

FORGOT THE BOARD.

Why Those Aboard the Stockholders' Special Didn't Spend Half a Day Viewing the Western Scenery.

BY F. B. LOVETT.

SHORTLY after the C M. and P. S started trains over its western extension, and while its block system was pretty much of a joke on that part of the road, I was holding down the third trick at St. Joe, Idaho.

The next night office, east, was Avery, the division point, thirty-six miles away. It was a rather extended block, and if my brother telegrapher at that point ever asked me for the block for a train until long after it had left his station, I do not remember the occurrence

St. Joe, and in fact all of the night offices on the pike, usually had a large number of slow orders on hand, owing to the unsettled condition of the road-bed, so the signal generally remained unmolested by the night owls.

The water tank at St. Joe was about six hundred feet west of the station, so that if a train ever did get a clear signal when taking water it had attained pretty fair headway by the time it reached the depot

One morning about three o'clock, after I had been on the job a month and had become used to paying no attention to the signal, a stock train, after a record run to the east, entered the west block. The despatcher called me on the phone, asking:

"Any slow orders, St. Joe?"

"None. I replied for the first time since the station was built

"All right," he said, "I'll have nothing for the stock. You better get the east block and clear the board now so you won't forget to do it. If you stop him after he takes water, you'll have to whip the train crew and get canned besides."

"Leave it to me," I answered, giving the signal a nimble twig before going after Avery for the block, knowing that it would take me from thirty minutes to an hour to get him. That was the way the block was run at that time.

The stock train arrived and was "high balled" east from the tank with only a wave of the lamp of the conductor as he stepped inside the caboose

It was the first train crew that had passed on my trick without coming in and cussing slow orders, the Milwaukee Railroad, or myself since my arrival at St. Joe. It was, therefore, quite an incident, and in the contemplation of it I forgot to restore the signal to the normal position of danger.

Series began in the October, 1906, Railroad Man's Magazine. Back numbers for sale at this office.

About seven o'clock in the morning I was awakened by the despatcher's bell.

"That special coming from the west is a bunch of stockholders on an inspection trip. Tie up all the wild animals around there and sweep the station platform," he said.

"On the job," I replied briefly.

"Copy 31," he continued, and proceeded to give the special a meet at —— with a westbound extra, then presumably about ready to leave Avery.

I chased the station dog off the agent's desk, very much to that privileged animal's surprise, and otherwise made such changes for the better in the appearance of the station that might bring forth approving glances from the touring stockholders.

In the mean time the special, containing five or six cars, arrived at the water-tank. As I slipped on my coat and the agent's cap and struck an alert pose in the window, the special left the tank. As it gathered headway, it looked to me like a train going out of town; but being easy to handle, I concluded that the hogger was going to take them to the platform with a flourish and make a grand-stand stop.

As the engine was within fifty feet of the platform and showed no inclination to slow up, my counterfeit pose of vigilance of the company's welfare changed to one of wild consternation.

Wildly waving my hands like a windmill—not being accustomed to using hand signals, and forgetting for the moment just how to make the proper gestures to stop—the train flew by and the genial stockholders and smiling conductor cordially waved to me in gracious approval of what they evidently considered my praiseworthy enthusiasm.

Seeing that I could not stop them from the window, I made a wild effort to reach the track. The station dog taking my frantic gesticulations as a desire to frolic, was barking madly and jumping in front of me. Forgetting my affection for the animal in the excitement, I ejected him from the scene more forcibly than politely.

When I reached the track the special was whistling blithely for the bridge around the curve. About this time I looked aloft at the clear signal and the probable result of my own forgetfulness threw me into a blue funk.

"Here's one railroad that'll be without any stockholders, and one operator that'll surely get hung," I muttered as I hurriedly reentered the depot.

Wildly I rung for Avery on the block phone.

Nothin' doin', as I expected. I couldn't raise him.

With my heart in my mouth I opened up the despatcher's 'phone.

"Hello, despatch! St. Joe!" I managed to articulate. "Has that extra west at Avery signed up order No. 7 yet?"

"Twenty minutes ago," he assured me.

"Have you an OS from Avery yet?" I further questioned.

About this time the drawling voice of the operator at Avery broke in:

"Say, despatcher, if that special has left St. Joe, them stockholders'll have a chance to look the scenery over at —— for about half a day. That wild Irish hoghead put three of 'em off the main line tryin' to jerk the rest of 'em out of the side-track."

"How about it, St. Joe?" asked the despatcher.

"Yes, he left all right," I shouted, "but he didn't get that order No. 7. I forgot to put the board out again after I cleared the stock."

"Say, you're a lucky guy," came sleepily from Avery.

IN THE BURNING MAIL-CAR.

What Jackson Did for a Comrade at Hangingmoss Creek, When They Were Penned in by the Flames.

BY W. H. WELLS.

HANGINGMOSS CREEK was the terror of the line. When there were no rains, it crept harmlessly along under the bridge that spanned the short gap between the hills. But when the southern torrents fell on the slopes, swelling the creek to a flood, the waters were violent and destructive.

Once a year in such a season the bridge went down. Wrecks were averted only by the narrowest margins. Delays were frequent and traffic was paralyzed, for Hang-

ingmoss Creek was on the main line. In the beginning, before its treachery was realized, it had taken its toll of railroad. They had been swept to their graves unwarned.

That human life might be safeguarded, the company had ordered the removal of the bridge, the road-bed was raised and a giant culvert set across the creek. Yet the men on the P. and D. did not trust Hangingmoss. Each man in the crews that took the trains over the line felt an almost intangible fear that some day they, too, might follow their comrades.

There were five of us in the mail-car running out of Memphis that night—five men filled with eagerness to reach home and kin. Old man Flannigan whistled his anticipation as he worked, for he knew that the soft, joyous arms of his grandchildren were longing to wind themselves about his neck and fasten kisses on his cheeks. At another of the pouches Jackson was swiftly sorting. He worked silently, dreaming of the girl that he had married but a few weeks before.

Ruskin, Johnson, and I, unmarried, were perhaps the most indifferent of the lot. Nevertheless, it was the week of the Christmas holidays, and a kindly spirit seemed to bring us close. We were more than men thrown together by the chance of circumstance. We were brothers of one great race.

A freight-engine had been assigned to our train in place of the usual mogul, and when we reached McComb, we learned that we were five minutes late and apparently constantly losing time. Still, the train's record was unusually good, and we felt that the delay, the first in many weeks, was excusable in face of the extenuating facts. So we labored cheerfully.

At Jackson we found that we were forty-five minutes behind our schedule. Flynn, our engineer, fumed and swore that he would run into Canton on time if he had to blow the old freight-engine up. Five miles to the north was Hangingmoss.

Ruskin and Johnson reposed in a corner on a pile of pouches, enjoying their relief. Old Flannigan, white-haired and bent, stood swaying with the car as he distributed the letters.

We swept around the curve and down the long grade. Suddenly, without a warning, the car left the rails, bumped along the ties, and stood on end. I will never forget the sensation, the clutch at my heart as I leaped blindly for the hanging rods.

Then the car settled gradually, and, horrified, I saw steel beams thrust their ragged points through the bottom of the car. I could not see, but I heard a terrifying crash, and I knew that the express-car had settled down upon us. Another crash told me that one of the passenger coaches had added itself to the burden that was grinding the mail-car to pieces.

In a lucid instant it came to me that we were at Hangingmoss Creek. I was not injured, I was sure, for I could move my body easily without pain. But I was imprisoned in a car that might burst into flames at any minute.

I tried to peer through the darkness. Then, to my horror, illumination came, ever so slight, but in a most dreadful form—fire. A little curl of flame was eating its way into the car. Had I been spared to suffer this frightful torture?

I thrust my hand through an aperture in the battered boards beneath me, and my fingers touched the soft banks of Hangingmoss. Around me lay the burning remains of the baggage and day-coach.

The light from the flames grew brighter. I could almost feel their heat now—and I saw the twisted body of poor old Flannigan lying in a huddled heap a few feet away. Ruskin and Johnson had gone to their deaths while they slept. I could faintly discern their mangled bodies in the ruck.

Only Jackson, then, and I, had escaped—and to face the fury of the fire!

I heard my name whispered hoarsely.

I turned my head and gazed into the eyes of Jackson, who had crawled from beneath a table.

Without a word our glance swept our surroundings, and just above it, we saw our chance—the mere chance to escape from the inferno—a hole in the top of the car. Through it we could see the ever-brightening glare of the flames.

I cannot tell of our escape. I passed through a phantasmagoria of which no impressions remained. Jackson saved me, for with the helplessness of a child, I thrust my hand into his, and after he had squirmed through the jagged opening, he hung there with one hand, the flames thrusting their eager tongues at him, while he helped me to crawl through after him.

When he saw that I had reached comparative safety, he fainted. His danger roused me to action, and lifting him, I staggered away and rolled down the side of the car that had not yet ignited.

I carried him away and laid him under an oak-tree. When the relief-crew came, he was dead, and I lay in a swoon. In a voice that seemed to come from a great distance, I heard the doctor say that he had inhaled the flames.

I knew that had he not paused at the hole to help me through, he might have staggered to safety as I had. In the moment of another's need, he had put aside every other consideration—himself, his young wife and the future—to help me. He had given his life as the forfeit.

FATHER'S SWEETHEARTS.

BY LENA SAMSON.

I THINK my mother's jealous
'Cause father has two girls;
His good old girl that pulls the cars,
And his little one with curls.

IN AN EXPRESS CAB.

Thrilling Moments During a Mile-a-Minute Ride with Ben Woodlief, Engineer of the Fast Chicago-Missouri Limited.

BY EDGAR WHITE.

"HOT night, ain't it? Like a breeze from my 'lectric fan? It will sure cool you off some."

The speaker was a compactly built, medium-sized man, with a strong face. He stood in his blue overalls beside a Class S 2, superheater, weighing 396,400 pounds with tender, coupled to the ten car train known to the public as the Chicago-Missouri Limited, and on the engineers' time card as No. 56.

The Chicago-Missouri Limited runs between Kansas City and Chicago, a distance of of 488 miles. The run between Kansas City and Brookfield, 122 miles, is the shortest between terminals, but is considered the most dangerous because of its many sharp curves.

We stood in the Kansas City Union Depot. It was a sultry fall evening.

The man at the engine was Ben Woodlief, and it was his nightly task to take No. 2928 between Kansas City and the Brookfield division at the average speed of 40 miles an hour.

"They say they're going to start boats to running again on the Missouri River," he said, as he glanced down his line of cars, "and that everybody's going to travel that way again some day. Maybe so. I went up the river once when I was a boy, and we were so long on the way I lost track of the days. There's one good thing about a steamboat, though—it won't run over anybody like the buzz wagons do. A steamboat's quieter and easier on nervous people. If they ever start 'em again—"

A whistle sounded in the cab. The engineer climbed up the gangway. Then he reached a big hand down to me.

"Here, don't get scared about soiling your clothes. Gimme that katy. The 'lectric fan'll blow it off. Hop on Bill's box there and don't let go. I'll lend you my 'specs.'"

BEN WOODLIEF, ENGINEER ON NOS. 55 AND 56, THE CHICAGO-MISSOURI LIMITED.

Mr. Woodlief threw the hat under the fireman's seat-box to the left of the big boiler, which extended quite through the cab. Then he moved over to the right-hand side and gently touched a long, slender lever. The train started as gently as a hammock moved by a summer breeze

The fireman grasped a chain and swung open the great door of the furnace. A flood of light swept out, painting the spider's web of tracks a deep red. With admirable accuracy five scoopfuls of coal were deposited in the white-hot cavern.

The iron door was closed, leaving the cab in darkness. There were shaded electric lights that could be switched on to read the water and steam-gages, speed indicator, etc.

"Red Eye!"

The train was now out of the bluff bordered "goose neck," and on the steel bridge spanning "The Big Muddy." Reflected from its mysterious depths were hundreds of arc lights that glowed uncannily amid the verdure of the bluffs. The beams and bars of the bridge rattled as the heavy train glided over in a gently rocking motion.

The bridge cleared, the long lever came out a little farther. Dead ahead, the electric light in front of the boiler bathed the road, the paralleling side tracks and long lines of freight-cars in noonday brilliancy. On the right the river, nigh bankful, flowed dark and sullen, but the road-bed was high and dry.

The lever came out a little farther.

"Red Eye!"

Off went the steam and the train drifted. The air shrieked threateningly The limited came to a full stop, the air pump panting vigorously. Engineer and fireman looked searchingly to the east.

Presently, like a will-o'-the-wisp a white light appeared out on the prairie, seemingly miles away. Now you saw it; now you did not. Each time it was larger. Then there was a far-reaching ray like the flashlight of a battle-ship stretching across the sea. The train from the east roared in, the lighted coaches crashing harshly across the switches.

Still the semaphore ahead glowed red. There was another "will o' the-wisp" to come from the prairie.

"We call this end of the line Snake Run," said the engineer as he walked across the deck and crouched beside me, "because it's as crooked as a shell-man's reputation. It was laid out in the days when they thought it easier to go round hills than through 'em.

"White Eye!"

"It's said the fellow who located the line between here and Cameron had one extra course in his box of blue prints, and committed suicide because he couldn't find any place to put it. I don't know whether that's so or not, but that's what "

The other "will-o'-the-wisp" was thundering in. It was a long freight-train drawn by an enormous engine that seemed to sputter steam from a hundred pores

"White Eye!"

"Hold tight! We're going now!"

The engineer resumed his seat and became as rigid as a carved figure. The safety-valve was splitting the air with a column of white as the 69-inch drivers began to turn. The track ahead swung around majestically sloping hills. It was up-grade, rising from the river.

As the big engine careened around the curve the side of the cab struck me on the head. I could not move, for on the other side was the boiler, close enough to scorch my clothes.

No Talking in the Cab.

It was a beautiful rolling country, with the right-of-way taking the levels and winding in and out like a scenic road. To a tenderfoot it seemed a desperate thing to take these curves at full speed, with the tall engine swaying first one way and then the other, but there was an abiding confidence in the alert man who sat as a figure in stone, his head out of the window, one hand on the throttle and the other on the air, his body rocking with the engine as though a part of it, the keen eyes fixed steadily on the flash light pathway of the rushing train.

There was no attempt to talk in the cab. It was like a battle-ship in action.

Every wheel and rod and valve and tube was doing something. Like a fierce stallion, resentful of a tremendous handicap, the monster of steel and iron struggled angrily. The blasts from the "sawed-off" stack were like detonations of musketry.

"Birmingham!"

The red lights of a passenger-train on a rival road were clearing the town. No. 2928 seemed to quiver with a new excitement; to feel the responsibility of the situation. It was a course fit for a chariot race. The engineer looked across at his passenger. There was a ghost of a smile on his strong, soot-blackened face. Then he pulled out the long lever.

The "musketry fire" blended into a continuous roar, rapid beyond words. The tail lights on the parallel track seemed to stop; then came closer. The Limited was gaining. Passengers crowded out on the observation platform of the train ahead.

Soon they were almost abreast of the cab of No. 2928, and wondering why it was so. The broad glare of the headlight mocked them with a dazzling radiance, and then left them in the dark.

Racing Neck to Neck.

Inch by inch the Limited gained. The engines were struggling breast to breast, both safety-valves tearing the air. The firemen worked frantically, heaving in the coal. Like volcanoes the short stacks of the engines tossed smoke skyward. Trip-hammer blows from the heavy drivers resounded on the 90-pound rails.

A tornado rushed in through the narrow window alongside the big boiler, beating mercilessly against my face, and I was glad that I had those heavy goggles for my eyes. I understood now what Ben meant when he talked about that "'lectric fan."

The white road bed rolled under the train as though some giant hand were rolling it up with lusty strokes. The engineer began to fondle some mechanism about the boiler. Then No. 2928 appeared to jump forward, leaving the other train behind. Far in the distance, it seemed, were people cheering. Ben glanced at me and grinned.

Abaft the big sand box the automatic bell tolled its slowly measured stroke according to the rules of the road. White posts came out of the night and flitted silently by like specters. A harsh, vibrating shriek aloft, as a banshee wail of approaching trouble, a white fence and a broad highway rushed by the Limited.

Then down the line appeared a soft light on the eastern horizon, the token of a town. Midway of it grew up another light, steady and brilliant. A train was on a side track. Again the long, tremulous banshee shriek.

In the Long Train.

I looked across the black boiler wistfully. I had heard of wrecks at switch-points, of a train taking the wrong track and crashing into another, and was hoping the engineer would shove in that long lever, and turn ever so little the tiny brass handle that applies the air.

What could a man do, wedged against that mighty mass of iron, carrying 165 pounds of scalding steam to the square inch? What would be left of him after the crash?

It was well that the broad streets of the little city were deserted at that hour. It was well that all the switch machinery had been laid good and true, for the bronzed man who leaned far out the window of No. 2928 proceeded on that absolute conviction.

Every strata of the world was represented in the long train men of finance and women of fashion were lounging in the luxurious sleepers, or partaking of refreshment in the dining-car.

In the coach behind the express car was a mixture of Rumanians and Greeks going across the State to work in the great cement plant at Hannibal, and Italians to toil beneath the sunlight in the coal-fields of Bevier. There were curious musical instruments on which some of the aliens played while their companions sung the songs of their far-off land

Patrician and plebeian, they were pilgrims on the same highway, all making the same progress, all feeling sublimely secure in the eternal vigilance of the man with the soldier face, who was watching out for them, and whose honor was in bond to bring them safely home.

As the night wore on a round moon swung over the prairie and began to lift the darkness. Far-stretching fields of corn in shock, the shocks standing in long rows and looking like Indian teepees in the moonlight, extended on either side of the right-of-way as far as the eye could reach.

Nestling to one side of each field, amid old elm and maple giants, was a white cottage, its lights twinkling out in the night as if extending a welcoming hand to the wayfarer. Long, hedge-bordered lanes run up to the track, and in some of these were waiting buggies containing a lad and a lass. One would wave his hat and the other her handkerchief as the roaring Vulcan and his lighted tail swept by.

From the forest bordering Locust Creek, a chilling blast swept into the cab, bearing with it the incense of the woods, the tall trees laden with walnuts and hickory nuts, the shorter ones with persimmons and papaws the glory of fall; the one time when old Missouri stands unrivaled by any country on earth for its climate.

Switches began to crash under the huge heels of No 2928, and tracks spread out from the main line until the electric eye revealed ahead what looked like the picture of a map. A last long roar, the token of home-coming, swept out from the bronze throat of the engine, the long lever went in, and the air hissed spitefully.

No. 2928 has finished her night's work, and another old girl, now panting in the eastern part of the yards, will take up the long, heavy train, with its microcosmic population, and keep on and on until the sky begins to grow gray in the east. Then will another old girl take the train on the last lap of the journey in the long, busy night.

WILL BUILD ROAD OF PANAMA DISCARD.

SECRETARY of the Interior Fisher has suggested that, when the Panama Canal is completed, the construction material used in that undertaking be utilized in building a railroad in Alaska from Seward to the Matanuska coal fields. According to *Popular Mechanics*, there were about 375 miles of rails and ties, about forty locomotives, and 700 flat-cars used in the construction of the canal. This material will all be of no use to the government when the canal is completed, and would no doubt be sold at a sacrifice, making ample allowance for depreciation. The cars that are used in the canal work could be converted into coal-cars very easily, but the gage of the cars and engines is 5 feet instead of 4 feet 8 inches, which is the standard, and some difficulty might be experienced in trying to change the gage There is no doubt, as Secretary Fisher points out, that if the proposed road be constructed, it would open up a vast territory for development.

ENGLISH ROADS COST $274,364 A MILE.

THE railroad edition of the *London Times* was devoted largely to the railways of the United States. An interesting part of the railway statistics published in the paper is a table showing the number of miles represented in each of the countries of the world and the capital outlay per mile on the road and its equipment This shows the mileage of the United States to be more than five times that of Russia in Europe, our nearest competitor, and nearly ten times that of the United Kingdom. Probably the most interesting part of the table, however, is the comparison of the capital invested in building and equipping a mile of railroad in the different countries The United States railroads are given as capitalized for construction and equipment at $63,631 per mile, while those of the United Kingdom are given at $274,364 per mile. Sweden, on the other hand, has her railroads capitalized at $32,829 per mile. The number of miles in some of the countries are: United States, 228,841; Russia in Europe, 41,427; Germany, 35,475; France, 24,989; the United Kingdom, 23,387; Italy, 8,699; Sweden, 8,242, and Switzerland, 2,825.

Two Ten-Dollar Bills.

BY DAN DUANE.

A Stranger Comes from South Africa and Leaves the Old Homestead in an Air of Mystery.

CHAPTER I.

On an August Afternoon.

ONE sultry day in August, two men were slowly nearing a prosperous looking farm on the outskirts of a small New England village.

"You say you know old Sprague well?" asked the elder of the two.

"You bet I do," vigorously replied the other. "I was once his closest neighbor, until he could no longer squeeze me, having squoze me dry!"

Both men seated themselves under the cooling shade of a mighty elm whose lofty, graceful limbs almost hid the house from view. At the same moment a maid emerged from one of the barns.

"Barbara," called out the young man, "tell Mr. Sprague a gentleman from Africa is here to see him."

"Why, Mr. Moffatt, sure I will," she saucily retorted.

"Don't say a word about me!" he yelled.

The maid shook her head.

"Mighty fine looking," said the older one—"his daughter?"

"Bless you, no," answered Moffatt, "a servant, but in New England a servant may be your college chum in the winter, you can never tell. Most of the farm hands are students."

"Indeed, but why don't you want old Sprague to know of your presence here?"

"Well, he has no time for me now I can no longer be of use to him. Sprague is a terrible skinflint"

"Hum! What has he done?"

"Well, he only got from me every stick and acre of land left me by my old governor, and like a phagocyte, he has completely absorbed it into his own."

The older man lost his abstracted, indifferent air for a moment and looked the other over curiously.

"You don't much look like a man who could be easily done," he said slowly; "but I guess you know nothing of doing anything either."

"Well," said Moffatt, "the governor knew I had no taste for agriculture, and gave me my bent a bit too much at college. I was all he had on earth, and I took advantage of his leniency, got heavily into debt, and before I could extricate myself, he died." Moffatt paused. "He died very suddenly, and while I knew he disliked Sprague, there never was an open rupture between them and the governor never took occasion to express himself openly concerning him. I didn't know he coveted our land. I gave him the chance to get it, and get it practically for nothing."

"How?"

"In this way," said Moffatt. "My college debts amounted to six hundred dollars. Sprague must have learned of this through his son, who was fired from college because of underhand methods at cards, and who frequently won small sums from me after the governor was laid away. Sprague came to me, and with the greatest assumption of friendship asked if there was anything I needed—advice, help, money—it didn't matter, he was at my service.

"'You know, Tom,' he said, 'your

father and I were lifelong neighbors and friends, and there is nothing I would not gladly do for his boy.'

"Naturally I grasped at his offer as a drowning man grasps at straw, for I was completely at sea, with no knowledge of working the farm or of father's methods of getting money. When Sprague said it was customary to give security, I gave him what I had—the farm. We drew up the papers without any legal formality: how could I guess his game? Well, it's all gone from me."

Moffatt was interrupted by the appearance on the broad veranda of two charming young girls.

The older man was too absorbed in his contemplation of them to observe Moffatt's manner.

"Who are they?" he asked.

"One's his daughter and one's his niece," answered Moffatt.

"Which one is his niece?" hastily asked the stranger.

"The fair girl with the lovely face." Moffatt replied in a stifled tone that attracted the other's attention.

The girls slowly sauntered across the lawn until they were within speaking distance, whereupon the younger said, rather shyly:

"Ah, Tom, Mr. Moffatt, why don't you bring your friend to the house? Are you afraid of us?"

"Well, Beth, your father has made a bugaboo of me, you know. I'm forbidden the grounds, to say nothing of the house. I'm a bad egg, according to him, unfit for his daughter, but especially for his niece, to communicate with."

"Please don't, Tom," said the other "Barbara said you had brought a gentleman from South Africa to see Uncle Sprague. What if he should have met papa?"

"I have, my dear," quickly answered the man from South Africa. "You are Dorothy Telford?"

"Yes, yes," said Dorothy, "and you?"

"Oh, my name's Mervine. Telford begged me to look you up if I had the chance, and here I am."

"To look *me* up?" exclaimed Dorothy breathlessly. "My father is—oh, tell me about him! How I long to see him, to take his dear face in my hands. I don't remember him at all, but I have a picture of daddy taken ages ago, and he has the most winning smile. Why, all the girls at school used to fall in love with him. It was funny."

Dorothy laughed a low, delicious laugh which made one long to hear more of it.

"You took the old fool's picture to school and showed it around among the girls?" asked Mervine.

"The old fool?" haughtily retorted Dorothy, with a quick change of manner.

"Of course; who but a fool would leave a girl like you behind him?"

"That's what I say," quickly interposed Tom.

Both girls laughed.

"It's a good thing for us Uncle Telford is such a heartless father, what would we do without Dorothy?" fondly asked Beth.

Tom heaved a mighty sigh. Dorothy drew Beth toward her and was about to protest when a rasping voice interrupted the quartet.

"How now," said Farmer Sprague, "what's this I hear? Tom Moffatt brings some one from South Africa to see me?"

"Yes," retorted Moffatt in as civil a tone as he could muster "Mr. Sprague, this is Mr. Mervine, a friend of Dorothy's father."

Sprague gave Moffatt a withering look

"I guess he can speak for himself, if he has a tongue in his head!"

Turning to Mervine and ignoring Tom, he said, "What brings you to this out-of-the-way place from South Africa?"

"Oh, just a desire to see the world and look in on Telford's daughter," answered Mervine, coolly looking at Sprague.

"Nonsense," answered the latter. "It is some flimflam game of this ne'er-do-well's," indicating in the direction of Moffatt with his thumb. "You'd better come out with the truth," fixing his small eyes severely upon Mervine, "or get out!"

"Well, I don't know," drawled Mervine, "much about New England hospitality, although I've often heard it spoken of very highly. Now, in my country, a stranger, especially when he has traveled thousands of miles, is always welcome, and should he happen to come from friends or relatives, he is triply so."

"Oh, Uncle Sprague, he comes from father, and it almost seems to me—" Dorothy paused with embarrassment.

"How does it almost seem?" gently asked Mervine.

"As though you were very close, indeed, to father and me."

"Bosh! What do we know of him? Have you a letter from Telford?" rasped out Sprague.

"Why, I have any number of them, but in that free and open country, we don't think to carry visiting cards and the like about with us," Mervine laughed heartily, then said soberly: "Telford has just sent you six hundred dollars for his daughter. Did you give it to her?"

"Why, no," said Sprague, surprised by the suddenness of the question into answering truthfully, "that goes toward her college expenses," he added.

"But Telford sent that for clothing, he wanted his girl to make a decent showing her last year at school."

"That's all fool nonsense," said Sprague angrily, "spoiling her with extravagant ideas of dress that she couldn't keep up. And what does he expect me to support her on? Here she's been idling in luxury all summer! The man must think we can live on air! I'd have you know that the cost of living has increased over fifty per cent since Telford deserted his family and left his wife and child for me to support!"

"Uncle!" said Dorothy in a pained tone

"Please, father," begged Beth. "We all love Dorothy so."

"Why, I understand that Telford has tried to make up for his early behavior," quickly put in Mervine, "and has been sending large sums of money that more than cover his daughter's obligations."

"Huh, huh!" grunted Sprague, "haven't I just told you that he has no idea of the cost of a family?"

"No; not such a family as yours," muttered Moffatt aside.

"Why doesn't father return, or let me go to him?" asked Dorothy.

"Would you go to South Africa?" queried Mervine.

"Would I?" breathed Dorothy ecstatically. "Is there a possibility that father may want me?"

"No danger," growled Sprague, "he was only too glad to shirk a father's responsibility—when you needed it most. If he were to write for you now, he could whistle before I gave my consent."

Dorothy turned away in grieved silence, while Mervine asked:

"You haven't adopted the girl, have you?"

"I've done worse than that. If she were my own I'd have greater authority over her."

"Over her money, you mean," suggested Mervine.

"Well, I don't know. Expect her father must be making some out there?" insinuated Sprague.

Their talk was interrupted by the stamping of horses' hoofs in the barn, and the coarse voice of a young man, raised in anger.

"I'll teach you to snort and cavort at me, my lady!" reached the ears of those listening.

"Oh, Dorothy, Frank is going to lash Pet!" cried Beth.

Both girls ran to the barn as a man in fashionable attire emerged, pulling a fine-looking horse by the halter, as he laid the whip on her quivering flank.

"You shall not whip Pet, Frank!" screamed Beth, as she flew at her brother, who was about to make some angry retort when he saw his father with a stranger.

"Take your horse and teach her better manners before I get a chance at doing it myself."

"Come here, Frank," called out his father. "This is my son, Mr. Mervine, a friend of Dorothy's father."

"How is old Telford?" asked Frank Sprague, "piling up the money-bags for his daughter's husband to spend, I hope."

"Have you an eye in that direction?" said Mervine.

"Yes, and a ten to one chance, eh, governor?"

"Why not?" his father replied. "I've tried hard enough to make a man of you."

"How does the lady feel about it?" inquired Mervine.

"I think she owes us that much, what governor?"

At that Moffatt could not repress his laughter, which burst out so unexpectedly and in such rich tones that a man who had been driving two farm horses up the road called out:

"Is that you, Tom? I'm mighty glad for a sight of you again."

As Moffatt walked toward the newcomer, Mervine asked who he was Sprague answered that he was his farm bailiff and a mighty clever fellow, too.

"Oh, Flute," snorted Frank, "I wish you'd stop praising your foreman in my presence. The fellow gets on my nerves with his air of assurance."

"Keep your thoughts and your French words to yourself, my son. I don't want to hear them."

"Well, let me go back to Paris and I won't annoy you with my presence."

"To Paris, eh," said Mervine, "so you have traveled some, too, I judge"

Moffatt and his friend approached the group before young Sprague had a chance to reply.

"Dick Winthrope is an old and very dear friend of mine, Mr. Mervine, and I want you to know him.

"Mr. Mervine is from South Africa and knows Dorothy's father."

The men clasped hands and unconsciously sealed a friendship that lasted through life.

"As I came up the road," said Winthrope, turning to the elder Sprague, 'I passed a little Frenchman who was inquiring the way to 'Sprague's Farm.'

"A little Frenchman," panted Frank guiltily. "What can he want here?"

Hastily he made his way down the road.

"This seems to be a day for strangers," croaked the elder, who felt that the Frenchman's quest was of a nature to reflect discredit upon his son. Rather than expose his delinquencies to the South African, he made a temporary truce with Moffatt and bade him take Mervine around the place while he and Dick looked after the farm laborers.

"The old man has his hands full with Frank," remarked Moffatt when he and Mervine were alone.

"So it seems. Tell me more of him He seems to have an eye on Miss Dorothy, eh?"

Moffatt could scarcely control his anger at what he knew to be an insinuation, for he valued Frank Sprague at his true worth and resented even an allusion to the possibility of success in old man Sprague's plans in this direction; but that heaven and earth would be moved to bring about the union of his son with Dorothy's money, he knew as well as he knew that the Moffatt acres had been swallowed by Sprague's rapaciousness.

"He doesn't covet Dorothy as much as some others do, but he covets her money more. It would be a sore blow to the old man were she to prefer some one else to Frank, and he no longer got the benefit of her money."

"The benefit of her money?" repeated Mervine.

"Sure," said Moffatt. "Her father sends her a handsome allowance, which he keeps and spends on his farm."

"The devil he does," burst out Mervine

Moffatt laughed bitterly, he was so impotent to interfere, to say nothing of correcting this evident wrong, and here was an opportunity playing into his hands, for obviously Dorothy's father had sent this agent to ascertain his daughter's feelings and to learn of her life during the years she had been a member of Sprague's family.

"Do you see that new wing to the house? Dorothy's money. Did you notice the new building on the road as we came up? Dorothy's money. Come over here to this beautiful new concrete stable."

"Stable? It isn't possible! That's a residence!"

"Oh, no, this is where the blooded stock is to be housed; where all the wonderful new machinery will be sheltered in bad weather. Dorothy's money."

"With her consent, I presume?"

"She knows nothing about it. Her fool father sends it to Sprague, and there it remains."

"Well, young man, you seem to know a lot of the old fool's business, as you impudently call him."

"I'd tell him so to his face, had I a chance," said Tom with some heat.

"The devil you would," sputtered Mervine. "Who are you?"

"Why, I'm a friend of hers," interrupted Moffatt, "and that's a good deal more than her father has been, isn't it? Were Dorothy not the lovely girl she is—unselfish, sweet, loyal Heaven only knows into what she might have developed."

Moffatt's tone betrayed him to the

elder man. Both were silent; wrung with their own thoughts. It was some moments before Mervine could find speech. When he did, he addressed Moffatt in an altered tone.

"You're a likely young fellow," said he, "why don't you try for her yourself?"

"On what?" asked Tom, "my salary barely supports me."

"Why don't you go to South Africa?" calmly asked Mervine.

Tom was swept off his feet with the suddenness of the cool question. It presented a fascinating prospect. He felt himself to be more a soldier of fortune than anything else.

"Why, I never dreamed of going there any more than to Mars," he laughingly replied. "What would take me there at this time when all interest in that country is practically at a standstill?"

"Why, man alive," retorted Mervine, "can nothing but a revolution make a country interesting? I tell you there's more in South Africa to-day than a thousand men dream of in their concentrated philosophies. Do you want to go?"

"Indeed, yes."

Moffatt saw visions of wealth and Dorothy.

"Good! I'll gladly put you in the way of getting there, and of making your way when you are there."

This Mervine did in very short order, for he felt the force of Moffatt's remarks, and realized at the same time that he was worth helping—and if in the end it should develop that Dorothy returned Tom's love!

The opportunity for Tom to have a quiet word with Dorothy presented itself at this psychological moment. The girls and Dick Winthrope were in the new concrete stables as the two men reached the stop. Farmer Sprague had given final instructions to Dick and was making his way in the direction his son had taken when he caught a glimpse of Tom and Mervine and flung a last word back to Beth.

"You girls better go up to the house and see that a little lunch is served to our guests."

"Yes indeed, father, we will," answered Beth; "come along, Dot."

Tom succeeded in leaving Mervine with Dick and made his way toward the house with the girls. Dorothy hastened on, and Tom soon found himself alone with the wrong girl.

"Beth, I'm going away."

"Yes, I presume so," she answered.

"But I'm going far away, and want to ask a question before I leave," he faltered.

Had Tom looked, he would have paused, for a telltale blush mantled Beth's cheeks.

"I'm in love, and afraid to tell the girl so."

"In love? Is the girl near at hand?"

"Yes, very close."

"Oh, Tom, why don't you tell her so?"

"I'm afraid she doesn't care for me."

"But she does—"

"How do you know—has she told you?" blundered Tom.

"Told me, who?" asked Beth.

"Why Dorothy, to be sure—will you ask her?"

"Ask her yourself," cried Beth, rushing into the house and tearing up-stairs.

Dorothy, hearing the noise, came out and found Tom standing on the piazza, in a maze.

"I never knew Beth had such a temper, I merely asked her to do me a little favor and she flew into a fury."

"What is it, Tom; can I do it?" asked the gentle Dorothy.

Tom sighed. He was so deeply enamored of this girl that he could scarcely speak to her, so he hedged.

"The fact is, Dorothy, I'm dead broke. Mervine has given me a chance to go to South Africa to make my fortune. Do you think I might ask a girl to wait for me?"

"Why not, Tom, if she loves you?"

"Dorothy, you make me the happiest man on earth, and do you really think—"

Dorothy, remembering the countless times she had seen Beth cover Tom's picture with kisses, hastened to reassure him.

"I don't think—I know."

"What a wonder you are," went on Tom, but still without sufficient assurance to look into her face—"an understanding is all I dare hope for. May I hope?"

Dorothy innocently felt that she was

helping both her friends, the bashful Tom and love-lorn Beth, so she readily answered.

"Indeed you may. You must be blind if you can't see that your love is returned."

The change in Moffatt's prospects within the last hour was almost too much for him. He had gained a valuable friend, a possible fortune in a new country, and the consent, as he thought, of a beautiful girl for whom he had cherished a hopeless passion to wait for him.

"By the gods, I'll be worthy of it all," was his thought. "Oh, to press her to my heart just once before I leave!"

"I'll not wait for lunch," said Tom aloud; "the sooner I get away, the sooner I'll return."

"But Beth?" asked Dorothy, surprised at Tom's sudden decision.

"You can say *au revoir* for me."

And then winged with hope that she might breathe a parting word, he lingered to ask for it when Dick Winthrope appeared.

"Ah, here you are, Tom. Your new friend tells me you are going to South Africa? If the few dollars I can spare will be of any service to you—"

"Why, Dick, old man," said Tom, overwhelmed, "this all looks like a conspiracy to rid the country of me; but I won't let foolish pride prevent me from accepting your offer."

Dick handed Moffatt two bank-notes, which Moffatt carefully placed in his wallet. These men were lifelong friends, and words between them were needless.

Dorothy looked on in pleased wonder. The manners of men with each other are a source of much bewilderment to women.

"When do you leave?" asked Dick.

"The sooner the better," and wringing their hands he made his way to where he had left Mervine a short time before. Dorothy gazed after him.

"I am so glad for Tom," she said, "he goes with a light heart into the unknown. I hope he returns in the same spirit."

Dick scarcely heard. He was alone with her for the moment.

"My darling, Tom's change of fortune may be a good augury for us. I am growing impatient to claim you."

"I am willing at any moment, Dick."

"Dorothy, do you see those two saplings yonder growing side by side?"

"Dick, we planted them when we were mere children."

"And year by year they have grown as our love has grown; taken root in the earth as our love has taken root in our hearts. But they are not planted deeper than our love, and when winter comes and lays its withering hand upon them they will brave the weather, defy the storm and, side by side, live on."

How prophetic Winthrope's words were he little dreamed, but Dorothy's gentle nature felt their import and she was unaccountably stirred. Meanwhile Moffatt had informed his new friend of his sudden determination to leave at once for South Africa. Mervine was rather unprepared for such action and laughingly suggested that he wait and accompany him back to the village.

"I think I've seen all I came for," he added. "Important business demands my presence elsewhere, but I would like to see Miss Dorothy again before I go."

CHAPTER II.

Moffatt's Departure.

WHEN Frank Sprague reached a point on the road where, unseen, he could hasten his steps, he almost flew over the ground to ward off the too near approach of the man he instinctively felt boded him ill. But that any one from Paris should dare follow him to America, trace him to his father's, in a remote section of New England, and call him to account, filled him with trepidation. The feelings that surged through his breast as he caught sight of the Frenchman would have completely annihilated him could they have been put in action. He controlled his rage, remarking:

"Well, Jacques Simon, what are you doing here?"

"So vere glad to see you, Meester Sprague. You think to escape us? My sister? Myself? You vere mistake. My sister, the beautiful Mme. Chapoteaut, you take her for, what you say, light woman, is it? You think play fool with me?"

Young Sprague laughed. "By Jove, this is a joke! Why, your sister is a

notorious character, as you well know, and as for *you*—" with a snap of his fingers and the exclamation "Flute!" he turned on his heel.

Jacques Simon jumped to his side with the agility of a cat.

"Flute! is it. Flute!" he hissed. "I have make inquiry. You will pay -you hear? You will pay vere quick!"

"Pay? Pay what, you fool? Why, I owe you nothing."

"You call ze debts of honor nozing?" gasped the excitable Frenchman. "Maybe *le père* will zink ze other way. You pay, of father, sister, sweetheart -oh! I have been inform. All will know what life you have live in ze gay Paree, yes, yes. I vill tell, quick!"

The young men were too absorbed to hear the approach of Farmer Sprague, who overheard every word that Simon had just uttered.

"What is your claim against my son?" he asked.

"One hundred thousand franc," replied Simon.

"It's not legitimate," said Frank, trying once more to bully the Frenchman, who, as an astute man of the world, was sure of his ground and knew that Farmer Sprague knew the value of getting him off the premises in the quickest possible time. He merely held up so the old man could see them, a number of "I. O. U.'s," and, with a shrug of his shoulders, looked from father to son.

"Say nothing of all this to any one and I will settle the matter satisfactorily within a few hours. You must see no one, speak to no one, and leave these parts at once," said the father.

"Vere good. I come back, when?"

"Don't show your face around here again, but do as I say and I will see you myself in a few hours."

Turning his back upon the Frenchman, he retraced his steps up the road, Frank following

"So this is what I have raised—a gambler?" he said at length. "I have toiled and slaved, lied and, yes, stolen! for that's what all my conniving amounts to, and for what?"

He turned a face upon his son that was purple with rage. Frank Sprague felt that the situation was too critical for him to manage, he could only falter:

"Why, father, why—er—er—"

"Hold your tongue and hear me! There's only one way for you to get out of this. Where do you think I can lay my hands on that amount of ready cash at this time, when every cent I could get has gone for improvements? I can easily mortgage the property, but you must and shall marry Dorothy, and that without delay!"

"Marry Dorothy! How do you know she'll have me?"

"Has she ever gone against my wishes?"

"But, father!"

"There are no 'buts,' do you understand? Unless you marry her, you are no longer a son of mine. Well?"

"Why, of course, I'm willing to marry the money—"

"Then don't delay. I'll drive to the village and see Lawyer Crosscup at once. When I get back, you will have spoken of my wishes to her, and your own hopes, and we will arrange for a wedding, perhaps before this man, Mervine, has had time to turn over in his mind any thoughts he has gathered about us."

The unconscious cause of this remarkable undercurrent of activity was as guileless and unsophisticated as she was sweet and pretty. Dorothy Telford was, indeed a *rara avis*. Instinct with womanliness to her heart's core, truthful, confiding, loving, she was worthy in every respect and wholly unaware of her own worthiness. Therein lay one of her chiefest charms.

Women of her stamp rise to superlative heights where they have given their heart's love.

Remembering her uncle's wish that Mervine be detained for luncheon, and feeling that Beth could be in no mood, after parting so hastily from her supposed sweetheart, to think of so material a thing as food, Dorothy suggested that Winthrope rejoin the South African while she gave household matters her attention.

The two men met as Mervine neared the house for a word with Dorothy.

"No," protested Mervine, "my young friend has decided to make tracks for South Africa without delay, and as I came here solely to look up Telford's daughter and report to him on my return, I shall go on now after leaving a package with her."

"I hope it's some direct word from him to her, sir."

"What business is that of yours, young man?" Although this inquiry was sharply made, it was accompanied with a twinkle in a pair of kind, shrewd, blue eyes and a winning smile.

Winthrope's first thought was, "Dare I let this man into our secret? Would Dorothy be willing?" His hesitancy did not escape the other, who more than suspected its cause and whose knowledge of men was such that he felt satisfied Dorothy was well protected at Sprague's Farm

"Pardon me, Mr Mervine, I have not Dorothy's sanction to express myself openly concerning her affairs, but were her father here—"

"You would measure words with him, eh?"

"Yes, sir, I would tell him what I thought of a man who leaves a girl like Dorothy in the care of—well, her uncle, for instance, and I would cross swords with him on another matter."

"What other matter?" quickly queried Mervine.

"I might answer you, 'What business is that of yours?' It really isn't, but her father and mine—"

"Are you the son of Henry Winthrope?" asked Mervine.

"None other," answered Dick, rather surprised at the show of feeling displayed by Mervine. "Dorothy knows nothing of her father's early association with mine. Sprague does, however; but there's no danger that he will let any one in on what he regards as a good thing, so I'm safe there."

"I see," said Mervine. "Telford has told me; but what about the restitution he made your father's family when things began to go his way in South Africa? I am very positive he spoke of sending your mother bonds of considerable value."

"Why, he did, yes, send us some paper, but it was not negotiable."

"Where is it now," questioned Mervine—"have you used it for lighting tapers?"

"I believe not," laughed the other, "it seems to me that paper is among my effects somewhere."

"Well, dig it up, and wait a moment—I have a card here bearing an address in New York City. I guess these people can set you straight on those bonds, but give me your word before I leave that you will attend to this little matter."

"There's my hand on it," said Dick heartily, pocketing the card as Sprague and his son came on the scene.

"Only an address in New York I gave your man here, an address concerning a new fertilizer," shrewdly said Mervine, reading the question on the elder Sprague's face.

"Hitch up a team, Dick, I am going into town directly. You will drive in with me," turning to Mervine.

"No, I prefer walking, and as my time is short I'll give a package entrusted to me by Telford to his little girl, and bid you all good-by."

"I guess it passes through my hands first. I'm in authority here," said Sprague

"This doesn't happen to concern you only the young lady."

Mervine's tone was too decisive for any further protest from Sprague, who felt assured that he would get the package from Dorothy at any rate.

"Where is she? Frank, you go on up to the house and tell your sweetheart the stranger has a posy for her."

This attempt at pleasantry fell flat, nor was Mervine enabled to follow up the insinuation contained in it, as Dorothy herself approached them at the moment.

Mervine explained to her his intention of immediate leave-taking and gave her the package from her father.

"I do not know why he does not come to me himself," she said, "but I am altogether certain he knows best. Will you give him a daughter's love and tell him that I long to throw my arms around his neck and assure him of my gratefulness for all he is doing for me?"

Mervine was too overcome with his own emotions to answer, he could only press her hands and huskily whisper: "God bless you."

A nod to the Spragues and he was gone. Moffatt and Winthrope were at the barns. To Winthrope he gave a long hand-clasp, saying, "Look after her," and linking an arm in Moffatt's he made his way back to the village.

"Open your package, Dorothy," said Farmer Sprague the moment Mervine had left the grounds.

"Please, uncle, I prefer opening so precious a message in privacy. But see, it reads, 'To Dorothy Telford from her loving father, William Telford. This package is not to be opened until three months after its receipt, unless some extraordinary event in her life makes it necessary!'"

"What tomfoolery!" sputtered the old man, "but there'll be an event soon enough, when you and Frank settle on your wedding-day. Have you spoken to her, Frank?"

"When have I had a chance to ask the fair damsel for her hand?" he remarked facetiously.

Dorothy listened in amazement to this talk. Whatever hopes and plans her uncle had nurtured in this direction he had carefully guarded. The girl was too overwhelmed to enter a protest. Both men mistook her silence for at least partial acquiescence.

"Well, well, lose no time! You know what I expect. Arrange the matter definitely during my absence. Where's Beth—we all seem to have forgotten to eat to-day."

CHAPTER III.

Two Letters.

FARMER SPRAGUE neither knew nor cared about Moffatt's departure. He had naturally forgotten his very existence since the quick development of the morning's events. His chief concern was to get the Frenchman away before any disclosures relative to his son's character could be made, and to insure his own future and that of Frank's by a speedy marriage with his niece.

He could entrust no one, not even Dick Winthrope, with this matter. After a hurried lunch, at which the absence of both girls was barely observed, he drove to his lawyer, where he was enabled to make a satisfactory settlement with Simon, whom he subsequently put on a south-bound train before he turned his horses' heads homeward.

Meanwhile Dorothy sought Beth, for whom her tender heart was heavy.

"Don't feel blue, Bethsheba. He'll come back gallant and true."

Beth was petulant and made a pretense of not understanding.

"Why, Tom, of course," said Dorothy, "he's gone to make a fortune for his lady fair—for you."

"No, it's *you* he loves."

"*Me!*" laughed Dorothy, "why Beth dear, you are a silly; your love thoughts have turned your brain."

"Didn't he tell you so himself? I told him to," honestly confessed Beth.

"You told *him* to tell *me?* Goosie! I have enough on my mind now, dear, without getting jumbled up over you and Tom. See here! Isn't this mysterious, Beth? Why do you suppose father does such odd things, bless him."

Beth took the package and read the inscription.

"He always has been a very strange person, I fancy. Dot, Tom will see him first, won't he? Oh, how queer things are. I fairly hate Tom."

"Why Beth, what is the matter? You don't. You are glad at heart that he has been given this chance!"

Dorothy's influence was so sweet and good that she soon succeeded in putting Beth in a cheerful mood. Hearing the girls laugh, Frank ventured to join them. It was from no delicacy of feeling that he approached Dorothy with a show of hesitancy. He had no taste for marriage, and, furthermore, Dorothy was not the type of girl to attract a man so wicked at heart as Frank Sprague.

How he could spare himself the annoyance of marriage and at the same time secure for himself sufficient means to leave the country until his father's anger had cooled off, was agitating his mind.

"Old man Mervine probably left you a handsome wedding present in that package, Dorothy," he began.

"It isn't likely"

"Well, I'll bet ten to one it is," he insisted, "for he knew father's plans concerning you and me."

"What plans?" asked Beth

This was precisely what her brother was angling for.

"We may as well let her into our secret, eh, Dottie?

"We are to be married, Bethsheba, and father has driven in to Lawyer Crosscup to have the papers drawn up."

"I wish, Frank Sprague, you would talk common sense and truth if you will intrude upon us. I have no more inten-

tion of marrying your brother, Beth, than you have."

"Not so fast, young lady. You will do just as father says- as you always have done," said Frank.

"Not in a matter of that kind. I marry to please myself, not you nor Uncle Sprague. I marry where I give my heart, and not one beat of it do I ever give you."

"It's not a question of heart beats, but one of an agreeable arrangement all around. It's good common sense and logic, and a little return for all the years we've taken care of you," flippantly went on the young man.

It had not occurred to him that Dorothy might oppose his father's wishes. With his empty vanity, he rather believed she would be only too ready to consent and that he might release her for a consideration. An easy life on ill-gotten gains was as far as his ambition led him.

"Frank, you are too disgusting," said Beth. "Come, Dorothy, let us go where he can't annoy you."

The afternoon wore on and dusk was approaching before Farmer Sprague returned. He refrained from any reference to his plans until the close of the evening meal, at which, as though by a preconceived arangement, each one carefully avoided all mention of Mervine's visit and the events of the day.

Winthrope seemed to be the only one in genuinely good spirits and managed to keep up a pretty flow of talk on subjects purely agricultural.

At length Farmer Sprague pushed back his chair and remarked:

"Well, when have you and Dorothy decided to get married, Frank?"

Dorothy grew white; Beth held her breath; Winthrope felt every pulse in his body pounding. Frank was the only calm one.

"Dorothy is coy, father. She would her wooer awooing go; she refuses to be hurried, although I explained that your dearest wish is also mine."

"There's no use in waiting, Dorothy. I mean that you and Frank shall marry, and marry soon; you don't need any wedding finery. If you care to, you, Beth, and I can take a trip to Boston; but I guess that's nonsense, too. You can go after you're married much better than before. Let me see—this is Tuesday; we can have the whole countryside out for a good jollification Saturday, and give all hands a day off, eh, Dick?"

Dick was watching Dorothy's white, agonized face. As the question was put to him, he arose with the intention of going to her, when Dorothy stopped him with a look.

"I'm sorry, uncle, to disappoint you. I can't marry Frank."

"You can't? That is the first time you have said 'can't' to me, my dear. You know we can do anything we want. I want this; it is my dearest wish."

"Perhaps," said Dorothy, "but I shall disappoint you, uncle, for I don't want to marry him—and I won't."

"You see, father, the lady demands gentle persuasion."

Dick ground his nails into his hands.

"You won't!" fumed the farmer. "I'll make you!"

"No, uncle," bravely spoke up Dorothy, "I couldn't marry Frank under any conditions even had I not promised some one else long ago."

"Ah, this is becoming interesting," said Frank. "Pray, who is the lucky swain?"

"Keep quiet, you idiot," sputtered his father. "What's this you dare say to me? You have given your promise! Great Scott, girl! don't drive me too far! Some silly boarding-school nonsense!"

"No, Dick Winthrope and I—"

Dorothy held her hands toward Dick as her voice faltered and Winthrope was at her side like a flash.

The old man jumped up, overturning his chair. He choked with rage.

"You — you — why, you miserable scoundrel whom I befriended—gave a home—kept from the gutter! You come like a thief in the night and steal the treasure in the house! You might as well put your hands in my pockets and rob me of money—yes, a sight better, for that's a criminal offense and I could have you jailed, but this—"

The old man clenched his fists and made several steps toward them.

"But this—bah! you're both crazy!" he sputtered.

"Do you think I'll give her up now? Go to your room, girl, before I say too much! And *you* out of my house and sight, you sneaking pauper! Out!"

The old man's face grew dusky. He

tottered and would have fallen, but Winthrope quickly caught him.

"Take the fastest horse and go for the doctor, Frank! I'm afraid your father has a stroke!"

And so it proved. The pressure of events crowded in the last few hours had been too much for the old man's rigid determination. His rapacity was his undoing

When Frank reached the doctor's office he found Lawyer Crosscup there, and both men accompanied him home. It was a fortunate thing for Winthrope that this occurred, as the moment Crosscup learned that all was over he remarked to the others, "That French transaction was too much for Sprague. It killed him"

The tragic termination of her uncle's selfish plans stunned Dorothy. Lawyer Crosscup's assertion quieted Frank's tongue for the moment. His intense egotism kept him so occupied that the entire conduct of affairs devolved upon Richard Winthrope in his capacity of general manager of the farm.

When all that was mortal of Farmer Sprague had been laid away, Winthrope requested Lawyer Crosscup to remain, more especially for Beth's sake, and explain the legal status of Sprague's heirs

It was learned that no will had ever been made, that in his meanness to make the most of Dorothy's money as it came along, he had incurred heavy debts in order to establish the model farm which was his ambition. The recent loan Crosscup had effected for him necessitated a heavy mortgage on the land itself, and it would require either a snug little fortune to clear the farm of all encumbrances or years of the strictest economy and ceaseless toil. As legal adviser to Beth and Frank, Crosscup put the question to Winthrope.

"Are you willing to remain and run the farm?"

"Hold on," said Frank, "he can remain here only on one condition; that he give up all idea of marrying Dorothy."

While Lawyer Crosscup had known both young men all their lives and knew each for what he really was, while he had long since suspected old man Sprague's machinations where Dorothy and her money were concerned, he was wholly unacquainted with the love-affair that existed between her and Dick Winthrope.

He looked, therefore, in amazement from one to the other and a great light dawned upon him when Dick explained that it had not been their intention of divulging their affection for each other at the time, but Dorothy's uncle had insisted on arranging an immediate marriage between his son and niece and forced Dorothy to show her hand.

"I am perfectly willing to leave the farm," he added, "but if I go, Dorothy goes with me."

"Dorothy stays here, under my roof if I have got to use force," hotly said Frank

"By what right do you expect to exercise such authority over me?" demanded Dorothy.

"The right of guardian, which, since the death of my father, falls upon me."

"What nonsense," sternly cried Dick. "Dorothy is no longer a child. Can she not say what she will do?"

"Yes," Crosscup told them, "she is of legal age; but as I understand matters here, her father gave her into Sprague's custody and authority, and unless he claims her or it is proven that her life here is unbearable, she will probably have to remain until one or the other condition is established to release her."

"Oh, if my dear father were only here to relieve me of this detestable situation!" said Dorothy.

"*The package from him, Dot!*" impulsively burst forth Beth

"Beth!" cried Dorothy, then turning to Lawyer Crosscup: "A friend of my dear father was here the day—uncle was stricken and gave me a package. Will you wait and open it for us?"

Dorothy rushed off before the astonished lawyer could reply, and returned in a moment bearing the message which the strain of the last few days had banished from her mind.

"'Unless some extraordinary event,' read Crosscup, "well, we are justified in opening it now," and, amid the breathless interest of his listeners, proceeded to do so.

"Here is a lengthy legal document," began the lawyer, "the copy of a will made in Cape Town." He ran his eye over it and said: "Your father is a man

of considerable wealth and standing in the country of his adoption. You will be quite an heiress."

"Oh, sir," said Dorothy, "his wealth does not interest me! Has he no wish to see his child?"

"Here is a letter for you, shall I read it?"

"Do," begged the distracted girl.

Crosscup cleared his throat and read:

DOROTHY, MY OWN DEAR LITTLE DAUGHTER:

By the time you open this and ascertain its contents, I shall probably have returned to my old and lonely diggings in South Africa. The thought that the stranger, Mervine, was your own dad in the very flesh has never occurred to you, I'm sure.

I wanted to see with my own eyes precisely how my little girl was being cared for, and I wanted her to see me and form an unbiased opinion of her rapscallion father before I put a certain desire of my heart up to her.

I want my little girl to see something of the world, the gay capitals of Europe, especially, before she finally makes the journey to that part of the world which has become dear to me—the great, free, open country where man can live as God designed him to live. If, after carefully weighing your feelings, the wish of my heart should find an echo in yours, I shall clasp you in my arms within another twelve months.

All my plans for your travels, together with a proper chaperon, are in the hands of my American lawyers, Gerry & Gerry, of Boston. Your cousin, Beth, may accompany you, if you so desire and her father is willing. He has been good, as far as I know, to my little girl, and I mean to be good to his.

The thought that troubles me is this—you may have no place in your heart for the father whom you have never seen. Let me say that I have stilled the longings of mine for you, because a mining camp is no place for a tender little girl; but my mining days are over, and if—well, I won't say any more—if Mervine impressed you favorably, you can see for yourself what an old, lonely man and South Africa have to offer you.

Dorothy, you must be quite a young lady by this time. What if—but don't commit yourself until I have seen him. Remember, Gerry & Gerry have my orders to carry out, and are yours to command.

Your anxious and loving father,

WILLIAM TELFORD.

The effect of this letter was profound. Dorothy was softly weeping; Beth was all eagerness to talk it over as it opened such new and startling vistas; Frank did a lot of rapid thinking and concluded before Crosscup finished that he would alter his tactics and make a friend instead of an enemy of Dorothy.

But his feelings for Winthrope changed from indifference to insensate hate that he should have snatched this "gold mine" from him, and he resolved to get even.

Winthrope was deeply affected by the letter; his heart, already full of the kindliest feeling toward Mervine, glowed for the eccentric but lovable man whose entire nature was revealed by the simple, direct, and honest appeal in his letter.

He again felt the warm hand-clasp and the significant words, "look after her." These words took on a deeper meaning now. Had he divined his love for Dorothy? Surely. And was he satisfied? What course would he wish him to pursue in the light of all that occurred since that fatal day?

These and many more questions of a similar nature surged through Winthrope's brain in the few moments that elapsed since Crosscup finished the letter.

"Oh, Dick!" Dorothy startled every one by the tone of her exclamation. "Father was here only a few days ago—where can he be now? Certainly not very far away. Can't we go to him at once? Can't we join him, wherever he is? Please, *please!*"

"I have been thinking of that, Miss Dorothy," said Crosscup, "and if you will allow me, I'll get Gerry & Gerry on the long distance phone at once and find out his whereabouts within a few minutes."

To get Gerry & Gerry was quickly accomplished, but another disappointment awaited Dorothy. Mr. Telford sailed for South Africa three days before, after entrusting a letter to them for his daughter. The lawyers talked as if they had some knowledge of its contents, and suggested that Dorothy, accompanied by a trusted friend or two, call in person for her father's latest message.

Frank Sprague felt that for the present he was entirely out of the reckoning and showed more cunning than one would have credited him with by quietly withdrawing, to brood, however, in secret, and hatch a plot, if possible, whereby he could come in for some of the good fortune that had befallen Winthrope.

It was decided that the girls, accom-

panied by Lawyer Crosscup and Dick, should make the trip to Boston early the next morning. They were in the offices of Telford's solicitors the following day. Here Dorothy was given the letter left by her parent so short a time before that she almost felt the warmth of his hand still upon it. In great emotion she read this letter to Beth and Dick:

MY DARLING CHILD:

I can scarcely believe that God has been so good to me; that He has allowed to develop in the daughter an exact reproduction of your beloved mother with all her tenderness of heart and purity of mind; that He has allowed me to know the manly son of my old friend and former associate, Richard Winthrope, and clear up a matter which I believed adjusted years ago; and, furthermore, which has given me considerable concern, that your future protection and happiness, when I am called to my last account, can safely be entrusted to him. He loves you. Trust him. Act as your heart dictates. I shall not lose a daughter, but gain a son.

Should my surmises be correct, it will not be necessary for my attorneys to carry out any instructions except to supply you with sufficient funds, as your husband will be a more fitting chaperon than any one else. I still desire that you see Europe, and this can be your wedding trip. Winthrope will be perfectly willing to come to Cape Town, else I'm much mistaken in my man. Pay no attention to any opposition offered my plans. YOUR FATHER.

(To be continued.)

DR. GOSS PROPOSES NEW LOCOMOTIVE.

Dean of Engineering of University of Illinois Suggests that Grate Areas Be Doubled and Patent Stokers Used to Economize Fuel and Increase Power.

THERE is no one making suggestions on locomotive design whose opinion is entitled to more respect that Professor W. F. M. Goss, dean of the College of Engineering, University of Illinois. Dr. Goss recently proposed a locomotive which, from practically any other source, would hardly be considered seriously. He based his suggestions on the necessity of having a larger fuel-burning capacity on locomotives if the power is to be considerably increased over present practise, and states that the first requisite in the development of such a design is a large grate area.

If a design can be made which will permit of double the present grate area, several important results will at once be secured. The total amount of fuel burned per hour can be greatly increased without an increase in the rate burned per square foot of area. In fact, the rate of combustion can even be reduced.

The increase of power in such a case would be proportional to the increase in the total fuel burned, while the reduced rate of combustion would avoid the necessity for special care in the selection of fuel; would allow the use of fuels now normal to locomotive service; would operate greatly to reduce the loss of fuel in the form of sparks, and would prolong the period during which the locomotive could be kept in continuous operation.

For example, when 6,000 pounds of coal are burned per hour on a sixty-foot grate, the rate of combustion is one hundred pounds per foot of grate per hour and the spark loss with many fuels represents fuel values which approach ten per cent of the coal fired. The collection of ash and clinker on the grate so much impedes the draft as to require a thorough cleaning of the fire after a run in passenger-service of from 100 to 150 miles. A greater distance if attempted must generally be run at reduced power. With a large grate these conditions are all changed. The burning of 6,000 pounds of coal on a 120-square-foot grate would reduce the rate of combustion to fifty pounds per square foot of grate per hour, and the spark loss to two or three per cent, and would permit continuous operation for a passenger-train of 300 miles between the cleaning of fires.

A larger grate would be at some disadvantages with reference to losses in the form of fuel left on the grate at the end of the run, and in the larger amount required to cover the grate in the process of starting fires; but these would be entirely neutralized by the possibility of increased mileage between the starting of new fires. With the larger grate, only half as many new fires would have to be made per thousand miles run as are now required.

While the same total amount of coal is burned in each case, it is evident that the eight

per cent saving in spark losses would at once be made available as an eight per cent increase of power; also that among the possible variations in the method of taking advantage of the presence of the larger grate, will be included the possibility of increasing the rate of combustion.

For example, an increase in the total fuel consumed, from 6,000 to 8,000 pounds an hour, would increase the power capacity of the locomotive thirty-three per cent and would involve rates of combustion which, judged by present-day standards in locomotive service, would be accounted low. If the rate of combustion were forced to a total of 10,000 pounds, the increase of power would be sixty-six per cent, and the rate per unit area of grate would still be below the maximum now common

There is, therefore, much to be accomplished by increasing the grate area of a locomotive. If the output of power remains unchanged, it will permit lower rates of combustion, a reduction of spark loss, and the use of inferior grades of fuel If, on the other hand, the rate of combustion per unit area of grate remains unchanged, the output of power may be increased in proportion to the increase in the area of the grate.

Locomotive grates having an area of 150 square feet or more necessarily involve new departures in locomotive design, since the width of such grates could not greatly exceed seven feet and its length would be from twenty to twenty-five feet. To fulfil these conditions, Dr. Goss suggests the adoption of an articulated form of locomotive which will admit of a space of twenty-five feet or more between the two systems of wheels, and in this space he would place the fire-box of the boiler, making the construction so that the grate would be three or four feet above the rail.

He the suggests stokers of the chain-belt or Roney type, located in series along the sides of the fire-box and feeding underneath the mud-ring. There would be a flat dump-grate running the full length of the fire-box in the center, and these stokers would have a movement toward the center of about from thirty inches to thirty-two inches. There would be a short arch along both sides above the stokers, so that the green coal passing underneath the mud-ring would be ignited under the arch and gradually pushed forward toward the center of the fire-box. He believes that ignition under these conditions would make practically smokeless combustion, and that the provisions for cleaning supplied by the stokers and the dump-grate would permit continuous operation for very long periods

Fuel supply would be carried in large hoppers or bins over the top of the fire-box, which would discharge directly to the stokers by gravity. The coal would not be handled by hand at any point. This would also permit the weight of the fuel supply to be carried on the driving-wheels of the locomotive

The barrel of the boiler would extend forward over the front group of wheels and a foot-plate carrying all the auxiliary machinery of the locomotive would extend over the rear group of wheels. Professor Goss makes no suggestion as to the location of the water supply, although this would probably be carried on this rear group of drivers. A fire-door would be placed in the usual position to give the fireman an opportunity to inspect the fire.

FROM THE TRAIN.

BY H. BEDFORD-JONES.

Written for the "Railroad Man's Magazine."

YEARS from her—how the wheels sing to me!
Miles from her—dearer and nearer!
Ever the whirling hours fling to me
Heart-cravings olden that cling to me
Soft through the dreams her eyes bring to me—
Dreams of her, nearer and dearer.

Wheels quiet, and the lights that shine
From all the quiet town—her town
One light is hers; but gives no sign
To me; one, of the sparks that burn
For hundred other hearts than mine
So near! Until the slow wheels turn
And down the night the light-sparks drown

There! I knew my heart had need of fearing,
Need to shrink from thinking of her so.
Ghosts of olden days and dreams come leering
From the stars to fright me as I go
Wreck and ruth of days and dreams heart-searing,
Pausing—passing—how was she to know?

SETTING THE STAGE FOR "WAR HAVOC." THE OLD WOOD-BURNING ENGINES USED IN THIS PLAY WERE DUG OUT OF THE SCRAP-HEAP AND PUT IN COMMISSION. TO CARRY OUT THE PLAY THE ENGINES COLLIDED AND WERE DAMAGED BEYOND RECONSTRUCTION

CANNING HEART-THROBS OF THE RAIL.

Exciting Experiences of the Actors Who Appear in Famous Dramas of the Rail That Are Made into Motion Pictures.

BY GILSON WILLETS.

EXCITEMENT prevailed in the home of Miss Anna Nilssen, leading lady of the Florida division of the Kalem moving-picture forces. A messenger has brought news that a train was coming with a large force of Federal soldiers to attack a small Confederate detachment of which Miss Nilssen's husband was in command.

If the Federals arrived, Miss Nilssen's husband and his men, now encamped a few miles away, will be slaughtered. The train must be delayed to give the Confederate detachment time to escape.

"There's an engine on the tracks near here," cried Miss Nilssen, to her colored mammy. "We'll capture it, run it down the line and wreck the Federal train."

"'Deed we will!" answered mammy, who was Mr. Hal Clement, dressed in a mammy's clothes.

Forth from the mansion they rushed like a shell to the Federal engine, while an operator with a moving picture camera ground their every movement.

The scene was Jacksonville, Florida, but in the canned railroad war drama called "War's Havoc," the action was supposed to take place in Virginia [illegible] Miss Nilssen

wore the flaring skirt of 1862. All the other characters, too, were clothes of the Civil War period. The mansion had been hired for the day, and on the railroad all traffic was suspended at an expense of one thousand dollars.

When Miss Nilssen, with her mammy, boarded the Federal engine—a real old wood-burner—she carried a large pistol. While the camera buzzed, she placed the pistol against the engineer's temple and made him open the throttle. Then as the engine gained headway, she ordered the engineer to jump.

Then Miss Nilssen ran the engine, for she had previously been shown just how to manipulate the throttle. Her mammy did a fireman's work, pitching wood into the fire-box. The camera man, perched on the tender, canned the action.

The engine reached a trestle. They spied the troop train at the other end of the trestle, rushing toward them on the same track. A head-on collision was inevitable. It was exactly what Miss Nilssen had set out to accomplish.

To save their lives, she and mammy must jump. The trestle was 25 feet above the river. But they had promised the Kalem director that they would jump. The camera man waited below, on a float.

"Did Miss Nilssen really make the jump?" I asked Mr. Wright, one of the chiefs of the Kalem forces.

"Humph!" grunted Mr. Wright. "Miss Nilssen and Clement certainly made the jump."

I asked the question because I knew that in another railroad picture play, a man dressed exactly like the actress made the jump for her. This play was "The Runaway Engine," by Frank Marion, the author and producer of many railroad photo-dramas.

In "The Runaway Engine" the hero-

MISS ANNA NILSSEN AND HER COLORED MAMMY (HAL CLEMENT) AFTER THEY HAD JUMPED FROM THE LOCOMOTIVE SO THAT THE PRETTY HEROINE MIGHT MEET HER CONFEDERATE HUSBAND (GUY COOMBS).

Copyrighted by Kalem.

MISS NILSSON, AT THE POINT OF A PISTOL, COMPELS THE FEDERAL ENGINEER TO LEAVE THE CAB, AFTER WHICH SHE RUNS THE LOCOMOTIVE HERSELF TO CHECK THE APPROACH OF THE UNION ATTACKING TRAIN. THE OLD ENGINE SHOWN IN THE PICTURE WAS IN USE SHORTLY AFTER THE CIVIL WAR.

Copyrighted by Kalem

ine was Miss Alice Joyce. Alone in the station in which she played the part of operator, she learned that an unoccupied engine was running away, and that unless it was stopped it would crash into the president's special

Miss Joyce ran to an engine that stood on the siding, sprang aboard, opened the throttle and ran the engine down the track to meet the runaway. The head-on crash saved the president's special

This picture was made on a railroad in New Jersey. Apparently no one save Miss Joyce was on board the engine, but as a matter of fact, three men were hidden in the cab They were real railroad men. Two were the engineer and fireman of the engine. The third was dressed and made up like Miss Joyce

When the engine driven by Miss Joyce came in sight of the oncoming runaway, it seemed to be making terrific speed. When the moment came for the jump, Miss Joyce ducked out of range of the camera, her double sprang into her place and made the flying leap.

Then the engineer stopped the engine, for the collision scene would be made later. Miss Joyce sprang from the engine and hurried back to where her double lay on the right-of way. She studied his posture a moment. He arose. Miss Joyce sprawled on the same spot in the same position

The camera began to click Miss Joyce arose, apparently fearfully bruised and battered.

Mr. Marion did not personally direct the canning of this drama, though it was made from his scenario. When he saw the tryout at the studio, he gasped as he saw the jump from the racing engine. So perfect was the substitution that Mr. Marion did not know of it until he was told later.

In "War's Havoc," after Miss Nilssen and Clement jumped from the wood-burner on the trestle, the railroad's en-

gineer, who was on board, stopped the engine

The Federal troop-train stood near. It consisted of two or three flat cars drawn by a wood-burner. The flat cars were loaded with Federal soldiers and officers

The director took his place near the tracks and, through a megaphone, instructed supers and principals as to what they were to do in the collision.

The troop-train and the lone engine then backed away from each other, till both were out of range of the camera, stopped, then started again

"Go!" megaphoned the director, and the camera began to buzz. As the train and engine drew near, they went very slowly, while the camera was operated at highest speed so that, later, on the screen, both locomotives seemed to be going thirty miles an hour. As the pilots touched steam poured from whistle and valves.

The Federal soldiers were seen, dimly, falling all over one another on the flat cars in the confusion resulting from the supposed shock of the collision.

"Stop!" megaphoned the director.

The camera ceased clicking.

"How long?" asked the director of the photographer

"I KNOW HE AIN'T A RAILROADER, SUE. HE SAID, 'QUARTER TO EIGHT' STEAD OF 'SEVEN FORTY FIVE.'"

"Hundred and fifty-five," was the answer. The scene had consumed 155 feet of film, which meant that it would take 155 seconds or about two and a half minutes to show the scene on the screen The picture projection machines run off films at the rate of nearly one foot a second, consuming 20 or more minutes for a standard length film, which is 1,000 feet

"Too long!" called the director. "We'll do it over again."

Accordingly the scene was repeated, this time within the required two minutes. This is the way railroad collision scenes are usually done, for it would

"IF YOU MAKE THE RUN IN TIME, JIM, THE GAL IS YOURS FOR THE ASKIN'!"

hardly do to wreck two engines, at a cost of thousands of dollars. One of the best of recent Reliance pictures is "The Yeggman," in which

IF I CAN'T GET A CHANGE FROM THE COMPANY TO RUN THIS ENGINE, I'LL TAKE IT BY FORCE

Copyrighted by Pathé

Henry Walthall played the yeggman, while the part of the girl station-agent was played by Miss Jane Fernley.

Walthall, a member of a yegg gang, was a fugitive from justice. Faint from hunger, he entered a lonely railroad-station. Miss Fernley revived him with a glass of water, then shared her lunch with him. At a meeting of the gang that evening, Walthall was told that money would arrive at that same lonely station and that his pals planned to steal it. Realizing that the girl who assisted him would be in danger, Walthall refused to be a party to the crime. The leader of the gang felled him with a blow.

When he became conscious, he staggered to the track where a limited was taking on water. At the point of a gun, he forced the engineer and fireman to run the train to the station. Meantime, the yeggmen had arrived. The girl barricaded the door. As the yeggmen finally broke in, she saw the train backing in.

Smashing the window of her office with a chair, she seized the money box and jumped to the platform. Walthall rushed to her as one of the yeggmen fired through the window. And the bullet intended for Miss Fernley lodged in his heart. Thus did Walthall repay the service done him by the girl.

Before playing "The Yeggman," Walthall took part in a railroad play that was regarded as remarkable. The play was produced by the French company, Pathe Frères, who make many of their pictures in the United States. The play was called "A Close Call," and was made on a New Jersey railroad, an entire branch of the road having been hired for the day.

Walthall, playing the part of a railroad man, learned that his sweetheart played by Miss Gwendolin Pates who was the operator at a lonely station, had been attacked while trying to thwart bandits in their attempt to wreck the pay-train. Walthall gathered a posse, boarded the pay-train and started to the rescue.

The bandits were shown piling ties on the track. Miss Pates, peering from a window, saw what was afoot. She rushed out meaning to run down the track and warn the train. The bandits seized her, beat her into insensibility and threw her across the tracks.

The train rushed into sight around a curve, just as Miss Pates regained consciousness. Walthall, in the cab, saw Miss Pates's danger. She waved her arms frantically. The train could not be stopped in time. Walthall hurried along the foot-board to the pilot, leaned forward and snatched Miss Pates from death.

"A dummy!" cried the astounded fans. "The figure on the track was not a girl. It was a dummy. No man could save a girl in that manner."

The figure on the tracks was not a dummy. That scene was performed backward. When the camera man began, the engine was going backwards, rather slowly. Walthall stood on the pilot with Miss Pates in his arms. As the engine continued to back, he laid her on the tracks. Miss Pates signaled weakly with her arms toward the retreating engine. Walthall then walked backward along the foot board and backed into the cab, while the engine flew backward at greatly increased speed, finally disappeared round the curve.

In canning the scene, the operator reversed the crank. When the picture was thrown on the screen, the engine appeared to be coming forward and the rescue seemed to be made as described. Every movement of the players was reversed.

One of the railroad dramas of the Essanay Company, of Chicago, is "Saved From the Torrents."

A railroad construction gang appeared on the shore of Lake Michigan, at a desolate spot many miles north of Chicago. With them came team after team, hauling huge timbers, ties and rails. All hands waded into the shallow waters of the lake and then, with much driving of short spiles and spikes, began to build a trestle.

Farmers, lumbermen, and railroad men looked on in wonder. Soon a trestle, hundreds of feet long and close to the water, was ready—for what? The trestle connected with nothing, led nowhere.

"It'll be used on the first day it's almighty rough on Lake Michigan," said the foreman, in answer to questions.

The stormy day came. The raging waters of Lake Michigan tore across that hastily constructed trestle with torrential fury.

At about noon, a special train from Chicago stopped near the trestle and a number of persons disembarked. Some were railroad men hired that day as actors, others were players in the parts of railroaders. A branch of a railroad had been elected for the purpose, and various scenes had already been canned at various points.

A hand-car was run onto the trestle and two players took their places at the hand levers. One was Francis Bushman, who was playing the part of a station operator. The other was Miss Dorothy Phillips, who was playing the part of the station agent's sweetheart.

"WHEN I GET THE MOGUL OILED UP MARY WE'LL ELOPE TO ST. LOUIS"

In a scene enacted elsewhere Miss Phillips had entered Bushman's office as a message was received conveying the information that a torrent was raging in the Chippewa River; that the railroad trestle there threatened to collapse; and that Bushman must wire the neighboring station to hold the express. He

message had been delayed in transmission and the express had already left the other station.

"We must save the train," Miss Phillips cried. "There's a hand-car here on the siding. Maybe we can stop the train before it reaches the trestle."

They had sprung upon the hand-car and pumped vigorously. The car had been canned to the point where it was supposed to reach the tottering trestle.

The express appeared in the distance. Dared they risk crossing that trestle? The swollen and raging river was tearing madly at the structure and at any moment it might be washed away. It was a case of life or death, but they would risk it.

"Let her go," the director cried.

Away sped the hand-car across the trestle. In another scene, the two are seen waving frantically to the oncoming train, which stopped in the nick of time just as the trestle apparently collapsed.

The director ordered the company to board the special train.

The train carried them to a point far up in Wisconsin. They detrained and proceeded to the shore of a river where there were furious rapids. Here the camera man set up his machine. The director, actors and railroad men gathered logs, timber, sticks, and other material that resembled wreckage.

When the director gave the signal to the camera operator, they hurled the wreckage into the rapids. One minute later, the concluding scene of "Saved From the Torrents," had been canned. The effect of the trestle's collapse had been produced by the rapids and the debris.

The Selig Company, of Chicago, also produces railroad plays. The most recent Selig drama of the rail is "The Girl and the Lantern." This play was made by Mr. Langley, from an adaptation of Elliot Flower's story.

"BRAVE GIRL! YOU HAVE SAVED BOTH [illegible] IN AND YOUR SWEETHEART!"

Copyrighted [illegible]

The heroine is Miss Kathlyn Williams She is supposed to be the sweetheart of Charles Clary, who plays the part of a railroad telegrapher at a rural station. Clary, one night, receives a message ordering him to hold a passenger-train to let the president's special pass

The message comes too late, for the passenger train has already left the station. He frantically phones Miss Williams, at her house, to flag the train. She drops the receiver, secures a lantern, covers it with her uncle's red bandanna, rushes from the house, climbs fences, walls, and embankments and reaches the track in time to stop the train.

For this play two special trains were hired and traffic suspended while the scenes were being taken. The crews of these trains were the actors.

One of the most daring feats ever performed by an actress in a photo-drama of the rail, was that of Miss Peggy Glynn, of the Thanhouser Company, of New Rochelle, New York.

She played the part of a young woman operator who is dismissed by the new general manager because he is prejudiced against women She discovers a wash out and through the knowledge of the schedule knows that a fast train is soon due. There is no time to hurry to the nearest station and have the train halted.

With a telegraph instrument and a few feet of wire, she climbs the pole and taps the wire. The man at the other end is asleep and does not hear the message.

For several minutes there is intense suspense, but at the very last moment, the new manager himself arrives on the scene and hears the message. The train is stopped just in time. She is wooed and won by the manager.

Miss Glynn climbed the pole while a vigorous wind was sweeping through the wires, swaying them continually and rendering her perch very perilous. It was one of the most sensational bits of realism ever attempted in a motion-picture play

A notable foreign railroad drama, now shown on American screens, is called "A Dead Man's Child," produced by the Great Northern, a Danish company, of Copenhagen. The big scene in this play is that in which a detective—played by Mr. E. Zangenberg—jumps from a bridge to the roof of a moving train, a special chartered by the Great Northern for the purpose.

"The Dead Man's Child" is the daughter of a count. She is kidnaped by two villains, one of them an Oriental doctor, who compels her to board a train in Copenhagen. Detective Zangenberg reaches the station too late to catch his quarry. He recalls that at a certain place in the suburbs, there is a bridge over the tracks. He races to the bridge in an auto, and as the train passes under the bridge Zangenberg leaps to the roof of the train. The camera man was perched on a platform built around a nearby telegraph pole.

Zangenberg then climbs down into the train, borrows the conductor's uniform, and then gains admittance to the compartment in which the count's daughter is held by the villains. A struggle ensues, at the end of which the villains are handcuffed and the girl is saved, thus bringing to a close a "three-reel" play, requiring one hour to show.

The train ran under the bridge as rapidly as was consistent with safety to the life and limbs of Mr. Zangenberg, but the camera operator turned the crank of his machine at express-train speed.

SUBWAY IN STATION FOR BAGGAGE.

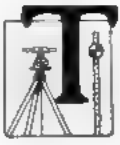
AMONG the many features of which the new Kansas City Union Station will boast, one of the most important will be the elimination of trucking baggage in the train-sheds. Two large tunnels are to be built, one at each end of the main portion of the building, through which the baggage will be trucked from the sub-basement of the new station to the tracks, to which it will be lifted by means of elevators. In this manner the trucks will be seen only near the baggage cars and will not interfere with the movements of passengers. One of the tunnels or subways will be near Central Street, and the other under the Main Street viaduct, the intervening space giving a good suggestion of the length of the main section of the building.

Work on the west subway is nearing completion. Massive concrete walls, which bear resemblance to sea-walls, line each side of the tunnel

Can You Beat It?

BY PERCY ATKINSON.

There Are Some Who Win and Some Who Lose and Some Who Can't Do Either.



THE wealthy rocks were in pledge at the sign of the three goose eggs, the glad raiment was on the wane and I was sitting by the fountain in Madison Square, New York, listening to the plash, plash of the water and the chiming of the clock in the tower, tolling off the hours and the halves and the quarters—loose change jingling in the pocket of Time.

I was down and out not for the first time, but for a long time. The future stared me in the face like a stepmother.

A well-dressed young man, fairly exuding impressions of prosperity, sat down beside me. Together we made a living picture for a patent medicine advertisement entitled "before and after."

For no reason in particular he turned to me, and as he caught my eye he opened up a case of conversation.

"If I was to fall in the East River I'd swim to shore with a new suit of clothes on," he said mournfully, drawing pictures on the stone pavement with his walking stick.

"And I, young fellow," said I, "well, if spaghetti was five cents a mile, I couldn't buy enough to lace my shoes. That's me."

"As bad as all that?" he sighed. "Heavens, man! how I wish I had your luck. Why is it that some folks have all the good luck, while others draw down the bad?"

"That," I said, drawing my coat up around my chin, "is a question that is older and more difficult of solution than the problem, 'How old is Ann?' I swear to goodness, I never prayed for the brand of luck that is at present camping out on the site of my past prosperity."

"Is your luck so terribly bad then?" he asked.

"Bad?" I said. "Why, man alive, if I were to tell you my troubles, you'd burst out crying. Listen."

"No—don't tell me," he replied; "I'd simply be consumed with envy. If a man was ever beset with the most inexplicable, intolerable, and worrisome luck, it's me. Why, listen here—"

"Don't!" I cried. "That envy stuff works both ways. But why a man with a string of good luck should want to change it, passes me. I draw cards."

"Have a cigarette?"

He passed me a gold-mounted case.

"To be brief," he went on, "six years ago my father died and left me a bunch of money—more money than you could figure. But I can have this money only when I am in need of it, and I have tried so hard to be in need of it, but it's positively no use.

"I have speculated madly, inadvisedly. I've blown in money right and left, openly and under cover. All to no purpose. Every dollar I've squandered has returned to me in some way or other and brought more dollars with it, and as for speculation—I simply cannot lose. With me there is no such thing as pure, unadulterated speculation. It's always a sure thing that I'll come out ahead.

"Just by the way of illustration," he continued, "one of the first things I did—I bought out a newspaper. I had been told that all other methods of inviting financial disaster pale into insignificance beside the simple expedient of

buying a newspaper property and then trying to run it yourself. Thousands of men have become millionaires through not buying newspapers, and it looked to me like one of the surest and simplest ways of coaxing the wolf through the door.

"The property that I purchased was decrepit enough, that's a fact. It was just about to slide gently and painlessly into bankruptcy, and I piled nearly every dollar I had into it.

"What happened? The managing editor, a poor, incapable wretch, died; but I found a worthy successor in a broken-down old newspaper reporter who hadn't been able to hold a steady job for nine years.

"I told him to go ahead the sky was the limit and to draw on me any hour of the day or night.

"He disappointed me shamelessly. To-day that confounded paper is making a handsome profit for somebody else, though. The minute I found it was actually paying, I sold it. I tried to sell at a loss; but it wasn't any use.

"The buyer, a politician with a rag for a conscience, wouldn't take it at my figure. He insisted on giving me thirty per cent more than I had paid for it, because, he said, he wouldn't be able to sleep nights if he robbed a poor orphan like me."

"How about the women?" I asked "They are usually willing and anxious to help along a cause like yours."

He laughed.

"That's where I made the worst failure of all. I thought the same as you did. I picked out a girl who had gone through a dozen neat little fortunes.

"For a time the outlook was great. Taxicabs, champagne dinners, theater parties, and a thousand and one ways of spending money were rapidly depleting my bank account. I began to see the bottom of the bag, when—well, the girl died, and what do you think? I'll be hanged if she hadn't made a will and left me every dollar she had, and her fortune was twice as much as I had spent on her. So I gave that up—nothing to it."

He offered me another cigarette. He didn't continue his story; he just sighed and a melancholy look crept into his eyes as he puffed half heartedly at his cigarette.

I didn't have words enough in my vocabulary to offer him consolation; but I was perfectly willing to do anything within my power to swap a generous slice of my luck for a goodly portion of his.

He wasn't in any danger of making any large sums of money sitting there talking to me, so I suppose that was why he took such a shine to me as to tell me his troubles.

Then, all of a sudden it's a wonder it wouldn't have occurred to me before - I happened to put my hand into my breast pocket and my fingers came in contact with the only thing in the world I possessed, which I considered nothing at all, three thousand, four hundred shares of stock in a perfectly worthless mine.

It didn't seem as if any one in the world invited or deserved poverty in this particular form; but that young man had touched my heart and I felt as if I ought to do something for him.

I was sure of that mining stock. I had issued it myself against a hole in the ground in Arizona that was dignified by the name of "La Quienta Smelting and Mining Company." It was a gold mine minus the gold.

"Have you ever tried buying mining stock?" I asked with a fast beating heart.

"Yes," he said wearily, "and the accursed stuff began paying dividends almost before I could turn around. So I sold it –at a profit."

"Well," I said, "I can put you in touch with some mining stock that for general bevel edged worthlessness can't be beat. These shares will cost you ten dollars each, and if you hold them until Judgment Day they won't be worth the paper they are printed on. Mining shares such as these have spread more unadulterated need, distress, and poverty among widows and orphans than the Civil War. The man who invests in them can kiss his money good-by, for he will never see it again."

"Where can I buy them?" he asked eagerly. "If there are enough of them to make it worth my while, I will buy the lot—the whole output—if you will give me your sacred word of honor that they are exactly as you represent them."

"My boy," I replied, "your fortune's made. Fate led you to this spot, and, as

Shakespeare says, before you sits the man who, by delivering to you these shares of mining stock, will do that which will enrich you not nor make him poor indeed. Behold!"

I drew the shares from my pocket and handed them to him.

"They—they look really valuable," he said without heart. "See how beautifully they are lithographed with pictures of cornucopias and ladies reclining on sheaves of golden wheat. Are—are you sure they are absolutely valueless?"

"Absolutely and irretrievably," I said.

"And only thirty-four hundred shares of them at ten dollars each. A mere drop in the bucket; but since you've been so decent to me, I'll take them. Every little helps. What's your name? I'll draw you a check."

"James Pulver Wilson," I said, "and is the check good?"

"It is," he sighed. "I wish it wasn't."

He handed it to me. It looked good enough. It was on the Lead and Coal Bank and was signed "Harrison Roberty."

I signed the transfer of the stock and the transaction was complete.

Anyway, I figured that even if his check was no good it hadn't much on that mining stock.

"I sincerely hope that this La Quienta mine doesn't begin to pay ten per cent dividends before the early part of next week," he said, shaking my hand.

"Don't worry about that," I answered. "That stock will pay dividends about the time the government gives every man a hand press and orders him to go ahead and print his own money."

The clock in the tower was chiming six as we parted. I walked in the direction of a hotel on Broadway that had been popular in our set once upon a time.

Was the check good? It was. So good, in fact that I felt uncomfortable about it as I walked out of the Lead and Coal Bank with a certificate of deposit for thirty-four thousand dollars.

I had traveled this world far and wide, fore and aft, and I had picked up and lost money in a thousand ways, but this was the strangest turn that the coin of Fortune ever flipped in my presence.

Very shortly, however, I accommodated myself to the gay circumstances. I saw the future looming up before me like a green bay tree. I have never seen a green bay tree myself, nor have I ever met any one who has seen a green bay tree; but I understand that it is something of a loomer.

In the days and weeks immediately following, I gave myself up to the luxury and abandon of being there with both feet. The shiners came out of durance vile, glad and glorious raiment once more draped my ambient form, and I opened and closed Broadway as of yore.

I had friends again. By right of largess I won admiration and respect of waiters, bell hops, and taxicab chauffeurs to an extent dreamed of only by predatory sons of the careless rich.

Before a month had ambled down the corridors of time, I had a new scheme all doped out and ready to launch on the public that should have made my permanent address Easy Street.

This was a plot that I had nursed along for years, had sat up nights with, and seen grow from a mere child of my brain to an adult idea. And thirty thousand dollars would push it over with the ease and grace displayed by a young girl corralling her first kiss.

Well, I hired an office in the newest, flossiest cloud-crowding building in the big city, and I had a sign painted on the door that read like the title of a fairy tale. Inside there was a green, grassy carpet, two oil paintings, and a rosewood desk that framed up like an invitation to the shearing shed, and then—the very day before I calculated on opening up, my hard-luck jinx arrived with his luggage.

The Lead and Coal Bank nonchalantly had wandered up that mysterious bourn from which no traveler returns. With it went my thirty thousand. The bank was all right, I'll say that for it. It was my jinx that did the trick. Even the Bank of England would not be able to withstand the curse that a deposit of mine would lay upon it. I didn't waste time hurling invectives at the bank; but I did launch a few shafts at the head of Fate and I hope they landed.

When the smoke of legal battle and investigation cleared away, the public got the near-facts; the president got six years, and the depositors got the merry, over-the-shoulder ha ha!

Well, I just set my rocks down in the

muddle of Broadway and they hustled to the sign of the three goose eggs all by themselves, for they know the way. The raiment began to wane, and there I was again sitting by the fountain in Madison Square watching the leaves float from the trees and listening to the big clock in the tower chime the hours that were ushering in a cold, hard winter.

I felt a tap on the shoulder, and turned around to face—who do you think?

Right the first time! It was, indeed, friend Roberty with the snows of another month or six weeks whitening his hair

He sat down beside me

"Well, well," he said, "how's luck?"

"Rotten," I said, turning up my coat collar to put the shirt in total eclipse. "And you?"

"I'm complaining, as usual," he said.

"I'd have thought that bust up of the Lead and Coal Bank would have set you back with a dull, sickening thud. It did me"

"Unfortunately," he said wearily, "I had in that bank only about a hundred dollars over the check I gave you."

"Well, that's too bad," I replied. "It caught me. I'd left the money I got from you on deposit there. Good night!"

"Oh, for your luck," he complained.

"There is one thing I will gamble on," I said, "and that is that La Quienta hasn't paid dividends yet."

"No, it hasn't," he answered absently, "and I don't think it ever will Yet yet"

"Great Heavens, man! You don't mean to tell me that, by any chance, by any"

"Only this," he said sadly, "about two weeks ago I had a letter from the Southern United States Railway saying they appealed to me as the largest, and apparently the only, stockholder in the La Quienta mine, to sell the property. They needed it for a right-of-way or something. So I sold."

"I'm mighty certain you never got thirty-four thousand dollars for the property, anyway!" I said.

"You're right there," he answered slowly, drawing out his big, heavy gold watch to set it by the clock. "I got thirty-five thousand."

Can you beat it?

WHEN THE PAY-CAR'S ON THE SIDING.

HE HAD BEEN GRADUATED.

THE father's suspicions were aroused as they whirled through the tunnel As they emerged into daylight, he saw the young man remove his arm from the girl's shoulders.

"I'll teach you to kiss my daughter," he snapped, glaring fiercely

"No instructions necessary," the young man retorted; "we've got it down to science"

THE REAL BOSS.

AN irate shipper once entered the general offices of a railroad company.

"Where's the general superintendent?" he demanded

"Out on the road," was the reply of the clerk

"Where's his assistant?" This very angrily

"Gone to the ball game!" snapped the clerk.

"Then where's the vice-president and general traffic manager?" exploded the shipper

"Gone North for the summer," was the still indifferent reply

"Well, then," the angry caller howled, "who in thunder is running this railroad anyway?"

"Oh, if that's what you want to know," replied the clerk as he reached for another typewritten report, "it's the newspapers."

HANDLED VACUUM EXPERTLY.

TWO men on a train were in an argument as to the action of the vacuum brake

"I tell you that it is the inflation of the tube that stops the train!" explained one

"Nothing of the sort!" was the reply "It's the output of the exhaustion"

At the next stop it was decided to submit the matter to the decision of the engine-driver Leaning out of the window of his cab, he listened condescendingly to the arguments of both men Finally, he said

"As a matter of fact, you're both wrong When we want to stop the train, we just turn this tap, which fills the pipe with vacuum."

THE FOURTH DIMENSION.

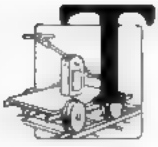
PASSENGER—"Why are we so late?"

CONDUCTOR—"Well, sir, the train in front was behind, and this train was behind before besides."

FAMOUS TRAIN ROBBERS.

2.—California's Peerless Bandit, "Black Bart, the P-o-8," Played the Part of a Whole Gang and Wrote Whimsical Verses to His Victims.

BY CHAUNCEY THOMAS.



TO the story of California, no man has lent a deeper tinge of real romance than "Black Bart," who was perhaps the most remarkable of California's many remarkable highwaymen. A picturesque embodiment of daring and adventure, he stands forth as the first man whose astonishing boldness and distinctive personality filled the history of train-robbers with the thrills of stirring exploits.

For many years he held up stage and train a quiet, gentlemanly, little man with a flowing tawny mustache, mild eyes, and clad always in a linen duster. For months he was a mystery terrible and unnamed, until what must have been an inherent penchant for literature impelled him to write for the edification of those from whom he reaped his plunder whimsical, defiant verses, signed always "Black Bart, the P-o-8."

In San Francisco, where he lived in a down-town boarding-house, he was known as Charles F. Bolles. After his capture, Charles E. Bolton was the name he revealed. It was no doubt real, but as "Black Bart, the P-o-8," he will ever be known.

Just before his capture he lived in a hotel in Oakland, California, where he was highly respected as a man of breeding and intellectual discernment. Here he lived quietly, his real character forever hidden by the panoply of conventionalities and reticence with which he had clothed himself. That this man of perfect manners and refinement was Black Bart, seemed to confront even the credulity of the most incredulous.

He did not drink or gamble, but spoke occasionally and with much vagueness of mines in Mexico in which he was ostensibly interested. He never disclosed his past, and when a companion evinced curiosity he politely diverted the conversation to subjects more pleasing.

He began his operations in Calaveras County in 1875, when California had apparently settled down to the humdrum of civilization. The Wells, Fargo & Company Express, driven by Billy Hodges, on its way from Sonora to Milton, was stopped by a soft-spoken man with a double barreled shotgun.

If Hodges thought of resistance, his determination was dissipated by the discovery that behind the thick timber and brush that lined the road were concealed the rest of the gang. Hodges could see their hats and the muzzles of their rifles.

"Let 'em have it, boys, if they resist," the soft-voiced bandit said.

He proceeded quietly to the robbery and disappeared.

Thus was California set afire by a new interest that promised to exceed that of the wild days of the first rush and the fight against mining camp lawlessness.

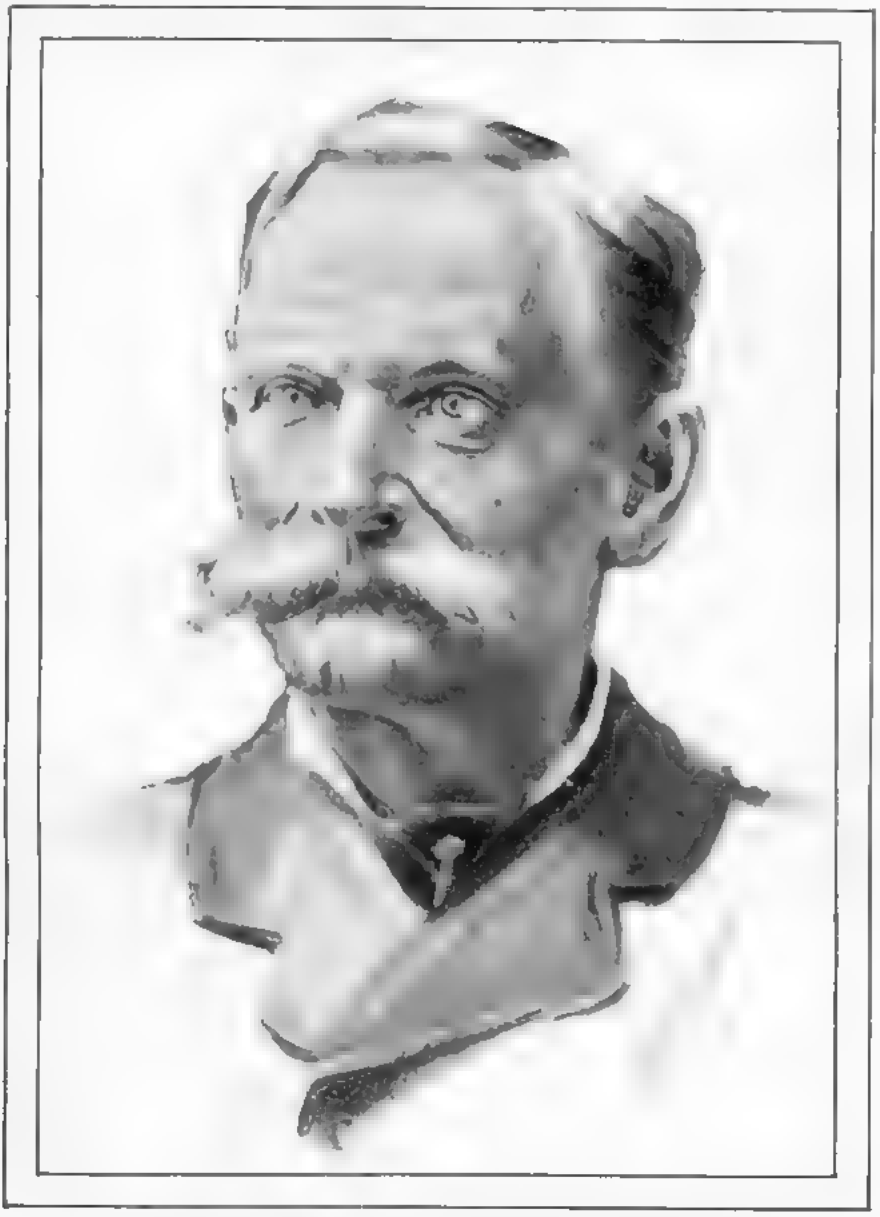
It was some time before the State received its second thrill. On the 28th of

The first article in this series, Bill Anderson, the First Train Robber, appeared in September

December in the same year, the express from San Juan to Marysville was held up and looted by the mysterious, wiry little man with the luxuriant mustache.

and wonder at the man's defiance and wonder at his manner and his success.

The name Black Bart, the P-o-8, was



CHARLES E. BOLTON, KNOWN AS "BLACK BART, THE P-O-8," THE MOST PICTURESQUE AND FAMOUS OF THE CALIFORNIA HIGHWAYMEN. BOLD, GENTLEMANLY, WELL-EDUCATED AND A VERSE WRITER, FOR YEARS HE BAFFLED THE CLEVER DETECTIVE STAFF OF WELLS, FARGO AND COMPANY

In May, 1876, the express from Roseburg to Yreka was held up. California was aroused with a commingling of fear

inseparably connected to his deeds and his character when, in the summer of 1878, he held up the Wells-Fargo Ex-

press running from Quincy to Oroville. After the robbery had been effected and he had gone, the following verses were found:

Here I lay me down to sleep
To wait the coming morrow;
Perhaps success, perhaps defeat,
And everlasting sorrow.

Let come what will, I'll try it on,
My condition can't be worse,
And if there's money in that box,
'Tis money in my purse
BLACK BART the P-o-8

Each robbery was as much like the others as if it had been staged. In each case the leader alone approached the coach, he of the long yellow hair, shotgun, and engaging, humorous ways. Never had a woman been inconvenienced, never had anything been taken except money and gold.

In each case there was timber or thick brush close at hand, which concealed the rest of the gang, whose numbers were variously estimated from three to twenty, depending on the state of the passengers' nerves. And in each case had the masked leader occasionally given orders to his gang concealed in the timber to cover some passenger who looked as if he might show fight. In several cases, when this had been done, the passenger, shaking under the muzzles of the guns in the shadows of the trees, had collapsed and sunk to the ground in sheer fright, while the leader was inside the coach looking for further loot.

And in each case all that the posse found was a short bit of verse, always in the same handwriting, signed "Black Bart, the P-o-8." There was no trail, either coming or going, and how such a gang managed to travel the country on horseback as if on winged steeds was only one of the mysteries connected with Black Bart, the P o-8

Reward of $30,000 Offered.

There seemed to be several gangs, for stages would be held up in the same day miles apart, sometimes more than fifty or sixty miles by road or trail possible to horses. Yet not a sign of hoofprint. And in each case it was the long haired man with a weakness for verse

One theory was that there were several gangs, acting in concert, and that the leader was disguised exactly the same in each case, and that the pieces of verse were prepared by the same man, as the handwriting was always the same, and left behind to create the impression that only one gang was at work.

Rewards totaling something over $30,000 for Black Bart, the P-o-8, dead or alive, produced no results. No one could trace, much less catch, a gang, or several gangs of stage bandits who vanished into thin air. One thing that was not the least part of the mystery was that the gang operated only at long and irregular intervals, often months apart, and never in the same part of the State, but that several coaches were always robbed within a few days, often in the same day; then all was quiet for a long time

Success in every line, even in robbing stage-coaches, always brings imitation, and several times it was gloriously announced by stage and express companies, by officials, and newspapers, that Black Bart had been either killed or captured But suddenly, sometimes before the ink of the announcements was hardly dry, sometimes months afterward, came several hold-ups in the same old fashion.

He Never Shed Blood.

He had been shot at several times, but had escaped unharmed. On the other hand, he had never shed blood himself. The suddenness of the attack, and especially those leveled guns protruding from the shadows of the timber, with the steady masks and hats behind them, had usually been enough to awe not only the passengers, but the messenger on the seat beside the driver

Stage-drivers in the West in the early days were not molested by stage-robbers. It was an understood rule, both with the State companies and the robbers, that the driver was paid to drive horses and not to fight bandits. He did as he was ordered, and that was the end of his duties. The messenger was paid to fight.

One day, after some months of peace, Black Bart suddenly stepped from behind a tree in a patch of thick timber, leveled his shotgun, and ordered "hands up!"

The messenger answered instantly with a load of buckshot from his sawed-off shotgun. Black Bart darted back

into the timber, the driver lashed the leaders into a run, and the coach tore down the mountain road for the station, some ten miles away. Several times Black Bart had failed to stop the coach.

When the usual posse reached the scene of the attempted robbery there was nothing, as usual, to be found, and no signs of a trail.

There were footprints in the timber along the road, but nothing else, except —*a shirt cuff*.

It lay in some bushes, apparently torn off or dropped by a man in hasty flight It was an ordinary linen cuff, clean and of excellent quality. It had been purchased in San Francisco, and bore a lone laundry mark in Chinese. That was all, but it was the only trace Black Bart had ever left behind him. This time he did not leave any verses.

The best detectives in California took that cuff—they treasured it higher than any bank-note ever seen in the West—and for weeks went from laundry to laundry hunting for its mate. At last, in a little Chinese laundry, they found a slant-eyed laundryman who said:

"All lightee. Him mine"

From then on the trail was easy. It led straight to the quiet little hotel in Oakland, and in that hotel the detectives found the mate to that cuff. It was on the wrist of the quiet little man who was interested in mines in Mexico, and was bored with accounts of stage-coach robberies. He surrendered quietly. He was Black Bart, the P-o-8

In a Corner.

He was too intelligent to deny his guilt, and was plainly amused as he told how he had carried out his numerous hold-ups.

"I had no gang," he explained. "I always worked alone. I never took anything but money and gold jewelry. The jewelry I always melted into bullion in the woods and sold to the mint here in San Francisco. I have no mines in Mexico, and have never been in that country.

"I had no confederates, I did not drink, and I had no woman to whom I might unwisely tell things. That is why they had such a hard time to catch me I always traveled alone on foot, and in the night, and I can cover as much rough mountain country on foot in a night or a day as any man in California.

"That is how I held up stages so far apart by measuring along the traveled roads. I simply took cross-cuts over the mountains, often crossing from one valley to another in half a day. There being no telegraph lines in such places, I was safe enough, as I was ahead of the news that Black Bart was loose again. You see how easy it was?"

"But how about those men back in the timber, and who was the man in the yellow hair? Some say it was a woman who was the leader?"

"Pshaw!" laughed Bart. "I wore that long yellow wig myself, and 'my gang,' as you call them, were only some old hats and red handkerchiefs I could easily carry in my pocket, and their guns were only sticks I picked up in the timber. The dimness of the forest and the imagination of the passengers did the rest, especially when I told some of my fake assistants to cover some weak kneed chap."

Always Worked Alone.

Improbable as his story was, investigation proved it to be true. Black Bart, the P-o-8, had always operated alone.

He had always been such a quiet little man, so kind-hearted that he would not shoot back even when shot at, that one sheriff was deemed plenty to convey him to the penitentiary. The officer led his prisoner on board the train, and as is usual, to save him from the curious stares of the other passengers, they two took seats at the extreme front of the car. This put the other passengers behind the two.

As a matter of precaution, more of official routine than anything else, the officer had handcuffed his famous prisoner to his own wrist. It was a long, hot, dusty ride, and the prisoner asked frequently for water. It was necessary for both to arise and go to the water-tank, just a few steps from their seat.

After a while the sheriff grew tired of this, so he unfastened the steel cuffs from his own wrist, and linked those of Black Bart together. Several times the prisoner stepped to the tank for a drink of water, and once asked the sheriff if he would have some.

The sheriff nodded assent, Black Bart drew a tin cupful and handed it to his guard, who drank it down.

The bandit took his seat and began a conversation about the future of grape cultivation in the State. Suddenly the sheriff grew ill. He locked his prisoner to the iron of the seat before retiring, to which Black Bart made no objection.

Although his right hand was chained to the car-seat, his left hand was busy picking the lock of the handcuff with a bit of watch-spring barely an inch long. The prisoner had been repeatedly searched, but he had kept this little piece of spring steel, hardly bigger than a pin, concealed by shoving it under the skin of his forearm, where the long hair practically hid the half-healed wound in the skin. Black Bart had put croton oil in the cup of water before he handed it to the sheriff. Where he obtained the poison is not known.

Makes a Getaway.

The car was quiet; the passengers had grown tired of gaping at the back of the famous hold-up; some were half asleep; the sheriff was looking out the window at the sage brush rushing past, when Black Bart suddenly swung the free end of the handcuff into the air with a vicious curve and crashed it down on the sheriff's head. Instantly he grabbed for the officer's revolver, and whipped it from its holster.

Half stunned as he was, the sheriff had sense enough left to grasp for his gun. The two hands met in a death grip, but the officer had hold of the handle and his finger reached the trigger. He jerked the trigger, thinking to shoot his suddenly desperate prisoner through the heart, but Black Bart's forefinger snapped down between the hammer and the cartridge, and the hammer fell on the finger.

The gun was a double action (commonly called a "self cocker") and the sheriff kept the hammer of the heavy revolver eating into Black Bart's finger as he yelled for help

The passengers had no desire to take part in a death fight with Black Bart. Although some of them were brave men and armed, they stampeded for the door at the other end of the car. Black Bart understood the panic-causing power of a surprise and had acted accordingly. He had used it for years in his stage business, and it stood him well in hand now, fighting for his liberty.

At any instant Black Bart might be free from the dazed sheriff, and with a revolver in his hand. The passengers had positive business at the other end of the train.

Caught by a Woman.

A woman was seated right behind the prisoner, and after a moment's rigid surprise she stood up, calmly threw her light traveling shawl over Black Bart's head from behind, covering his face, and jerked back with all her weight. This brought the prisoner, blinded, back over the back of the seat, and released the sheriff's gun. Instantly the sheriff plunged his weapon against the pit of Black Bart's stomach, and ordered the brave little woman not to release her hold on the shawl.

Black Bart, except as he twisted his head to one side to get air, lay passive as the sheriff chained both hands together. Then the shawl was withdrawn, the passengers came hesitatingly back to their seats, some rather shamefacedly, and things settled down as they were.

Black Bart made no comment, nor any further resistance. The sheriff and the whole State of California breathed easier as the heavy doors of the penitentiary closed on this remarkable criminal.

He made a model prisoner, and was released some years later, and came to Denver. Several attempts were made in Denver to connect him with some desperate crime or other, when the police could not locate the real criminals, but apparently Black Bart was cured.

He disappeared quietly from Denver, and though nothing authentic is known of his end, it is believed that he went to the East and died there, a reformed man. To-day one of the most valuable relics and mementoes of his remarkable career is his little sixteen-bore, muzzle-loading, double-barreled shotgun, now in the possession of the Wells Fargo Express

The history of "Three-Finger Musgrove," one of the most daring bandits of the West, will be published in December.

TIES THAT BIND.

The History of the Great Railroad Orders of America.

9.—BROTHERHOOD OF RAILWAY CARMEN.

Frank L. Ronemus, Almost Unaided, Helped to Create and to Preserve an Organization that Seemed Doomed, but Grew to Power.

BY THADDEUS S. DAYTON.

ABOUT sixty different occupations are classified under the general head of "carmen." Some work in steel, others in wood, but all take pride in the dignity of their labor. They know that any one of scores of things if carelessly done may cause death and disaster on our railroads. This sense of responsibility, this thoroughness and integrity, that is the basis of real safety, is an achievement of the Brotherhood of Railway Carmen of America.

It has raised an army of trained men who make possible the operation of giant systems with an efficiency unknown before its existence. A membership card in the brotherhood is a guarantee of competency

At every important point on a railroad there are great shops for the construction or the repair of cars. In every division yard light repairs are made to crippled rolling stock so that it may proceed either to its destination or to the big shops where it can be thoroughly overhauled. Most of this work is done on freight equipment and on cars that do not belong to the railroad making the repairs—"foreign cars" they are called.

The best of cars will break down hundreds or thousands of miles from home. The road on which the damage occurs puts them in good order and charges the parent line for the repairs in accordance with a scale prepared by the Master Car Builders' Association. This schedule of charges is a long one and takes in every possible contingency, from the replacing of a single bolt to the rebuilding of a car that has been burned to its trucks.

Railroad car-shops have developed many towns into cities. In some places these great shops have added populous suburbs to large centers of population. The Lake Shore's plant at Collinwood,

"Ties That Bind" began in the RAILROAD MAN'S MAGAZINE for February 1912. The following have appeared: Order of Railway Conductors, February; Brotherhood of Railway Trainmen, April; Maintenance-of-Way Employees, May; Brotherhood of Locomotive Engineers, June; Brotherhood of Railway Clerks, July; Brotherhood of Locomotive Firemen and Enginemen, August; Railway Mail Service, September; Order of Railroad Telegraphers, October. Single copies, prior to the July number, ten cents.

on the edge of Cleveland, and the huge shops of the New York Central at Depew, near Buffalo, are two of many such examples. In Altoona, Pennsylvania, the railroad has created a shop city of its own.

The car-shops of a great railroad cover many acres of ground. Some of them turn out one passenger-coach and ten freight-cars every day. These two branches of the work—passenger and freight—are almost as distinct as car construction and locomotive construction.

Steel cars are constantly becoming more common. Steel cars cost more, but they get out of order less easily. In wrecks that grind wooden cars into matchwood the steel equipment usually survives. Though steel is gradually replacing wood in freight and passenger-service and the number of steel workers is increasing, the carpenters are not likely to lose their vocation for many years.

A few of the occupations that are grouped under the general head of carmen include:

> Special car-builders, steel car-repairers, first and second class; wheel borer, wheel-press man, wheel-lathe man, axle-lathe man, car-carpenter, car-repairers, first and second class; locomotive carpenters, first and second class; tank carpenters, air-brake inspectors and repairers, car-inspector, car-oiler; pipeman, Baker heaters, steamfitters and plumbers, first and second class; cylinder-cleaner, coach-cleaners, first and second class; painters, first, second, third, fourth, and fifth class; tinners, first, second, and third class; air-brake inspectors in yards, wrecking foreman, wrecking engineer, mill machinists, first, second, third, and fourth class; tool room man, cabinet-makers, first, second, and third class; coach-builders, coach-carpenters, coach-repairers, and coach-trimmers, first, second, and third class; platform men, first, second, and third class; truck carpenters, first and second class; gas-tank fillers and cleaners, upholsterer, planing-mill man, car-repairers' helpers, truck and tender repairers, and unskilled carmen

Each of these receives a different scale of wages. On some roads the highest rate per hour is 32½ cents and the lowest 21 cents; on others it varies between 36 cents and 23. The differences in the wage-scales are caused to a great extent by local conditions..

The Brotherhood of Railway Carmen of America has a membership of more than 40,000 and has agreements with the principal railroads in this country, Canada and Mexico, covering the employment of its members, their working conditions, wages, etc. Its present prosperity and power are in striking contrast to its early vicissitudes. No labor organization connected with the railways had greater difficulties to contend with in its earlier years or has had the efforts of its founders crowned with more brilliant success.

Born in Iowa in 1888.

The first lodge of the brotherhood was instituted at Cedar Rapids, Iowa, the birthplace of several other of the great railway orders, October 27, 1888. It had its real beginning, however, as an idea, seven years before that. Its inception was due to one man, Frank L. Ronemus.

He and his brother, William H. Ronemus, almost single-handed, carried it through more than eleven years—some the most discouraging that a railroad order ever had—and finally, in 1899, set its feet firmly on the road to success. It is a stirring story of unselfish endeavor.

In the summer of 1881 Frank L. Ronemus first suggested to his fellow workmen—car-repairers and inspectors at Wilton Junction, Iowa, on the C. R. I. and P.—the formation of an organization of carmen. Nothing came of this, however. The only person who gave the idea any marked encouragement in those days was his brother. The two continued to advocate the organization of the carmen, but their efforts were received with indifference.

In 1882, Frank L. Ronemus was transferred to West Liberty, Iowa, where he remained in charge of a small force of men until the summer of 1886. In 1883 his brother went to Cedar Rapids, Iowa, and became foreman of night car-inspectors at that point for the B. C. R. and N. R. R. (now a part of the Rock Island system). In 1886, Frank also went with the B. C. R. and N., as foreman of car-inspectors and repairers at Estherville, Iowa, about 200 miles from Cedar Rapids. The brothers continued to talk organization to their associates, but nothing came of the idea for six years.

In 1888 W. H. Ronemus finally interested six other men in the plan for a brotherhood. They met in a combination baggage-and-smoking-car that was standing on the railroad-shop tracks at Cedar Rapids, on Saturday, October 27.

There and then the brotherhood's first meeting was held and the first lodge organized. It was done on the spur of the moment, and F. L. Ronemus, 200 miles away, did not arrive in time to become a charter member, but joined in the usual way during the following week.

The name given to the infant organization was the Brotherhood of Railway Car-Repairers of North America. All its charter members were car-inspectors. W. H. Ronemus was elected Grand Chief Car-Repairer, with Alexander Lynott, also of Cedar Rapids, Grand Secretary-Treasurer of the brotherhood.

The new grand chief, like his brother, was a man of determination. There was no roster of car-inspectors as there is now, and in order to obtain their names and addresses the head of the brotherhood copied them from the defect cards attached to sills of cars as they passed through Cedar Rapids.

Both he and his brother spent all their spare money for postage and all their leisure to sending letters to these inspectors in various parts of the country. They prepared a constitution and by laws, which seems rather crude now, and had it printed and distributed. Each of the other members contributed such sums as they could from time to time to pay these expenses, but carmen then worked for very slight wages and had little surplus cash. On the two brothers devolved the greater part of the burden of getting new members.

Organizers Faced Big Problems.

The work of organizing lodges with practically no facilities and with very little interest on the part of the workers was terribly difficult, but gradually it was done. It required fourteen months to establish lodges at Clinton, Iowa; Topeka and Wichita, Kansas; Pueblo, Colorado, and Fairbury, Nebraska. The first three were the result of a personal visit on the part of the grand chief, and the two others were brought about by correspondence.

While this work was going on another body of men who had not heard of the Brotherhood of Railway Car-Repairers, was engaged in a similar undertaking. On November 23, 1888, almost a month after the car-repairers had organized their first lodge, Sylvester Keliher called a meeting of the carmen at Minneapolis, for the purpose of establishing a brotherhood.

The objects of this second body were identical with those of the charter members of the original Brotherhood of Railway Car-Repairers. It was called the Carmen's Mutual Aid Association. A larger charter membership participated in the founding. There were fifty-seven present, and Mr. Keliher was elected grand secretary and treasurer of the organization. This was the only lodge of the association until October 31, 1889, when the second was established at Barnesville, Minnesota.

It was not until that winter that the heads of the two organizations learned of each other. W. H. Ronemus was organizing the lodges at Wichita and Topeka. Keliher was also making a tour and had established lodges at St. Paul, La Crosse, Wisconsin; Mason City, Iowa, and St. Joseph and Kansas City, Missouri.

Learns of Similar Order.

After Keliher had left Kansas City, Ronemus, *en route* from Topeka to his home in Cedar Rapids, stopped at Kansas City to see what were the prospects of organizing the carmen. To his surprise he learned of the Carmen's Mutual Aid Association. Finding that the objects of that body were identical with those of the car-repairers, he communicated with all his own lodges, called the first annual convention of the brotherhood to meet in Topeka, on September 9, 1890, and invited the Carmen's Mutual Aid Association to send delegates with a view of amalgamating the two organizations.

After listening to the reports of the two leaders the amalgamation of the two bodies was promptly effected by this convention. The name of the Brotherhood of Railway Carmen of America was adopted, a new constitution and ritual were prepared, and the following

grand lodge officers were elected: grand chief carman, W. H. Ronemus, Cedar Rapids; vice-grand chief carman, W. S. Missemer, St. Joseph, Missouri; grand secretary-treasurer, Sylvester Keliher, Minneapolis.

The grand executive board was composed of R. Hazelwood, Minneapolis; Charles Riach, Barnesville, Minnesota; P. Kelly, West Superior, Wisconsin; J. Wyman, Vinton, Iowa, and Frank L. Ronemus, Estherville, Iowa.

Consolidates with Canadian Body.

The declaration of principles that was adopted at this first convention has been upheld ever since. The purpose of the brotherhood was the promotion of friendship, unity, and true brotherly love among its members; the exaltation of the character and efficiency of carmen; greater proficiency into their department by a mutual interchange of ideas; to care for those in distress; to allow no one to become a member who did not lead a moral life, and to secure the passage of laws beneficial to carmen

Soon after this first convention at Topeka it was learned that an Indianapolis, the Car-Repairers' and Oilers' Protective Association had been formed during 1890, and that the Brotherhood of Railway Carmen of Canada had been established at Toronto in the same year. Neither of these organizations knew of the existence of the Brotherhood of Railway Carmen of America. After some correspondence both these associations decided to join the pioneer body, and they consolidated with it before the end of the year.

When the second annual convention met on August 4, 1891, at Pueblo, Colorado, there were 54 lodges in the directory and in addition 6 that had been instituted too late to be placed on the printed list. At this convention the following officers were elected: grand chief carman, W. S. Missemer, St. Joseph; vice-grand chief carman, B. F. White, Temple Texas; grand secretary-treasurer, Sylvester Keliher, Minneapolis, Minnesota.

The grand executive board consisted of: W. H. Ronemus, Cedar Rapids; W. T. O'Donnell, Minneapolis; W. A. Brown, St. Louis; John Caples, Kansas City, Kansas, and N. B. Chambers, Fairbury, Nebraska.

The third annual convention was held at St. Louis in June, 1892. One hundred lodges were represented. W. S. Missemer and Sylvester Keliher were reelected to their respective offices. H. J. Dacres, of Fort Worth, Texas, was elected vice grand chief carman. W. H. Ronemus and John Caples were reelected members of the grand executive board, the new members being L. P. Downey, Wellington, Kansas; D. D. McInnis, Duluth, Minnesota, and J. H. Rosen, Los Angeles.

This was the last of the annual conventions. Thereafter the meetings were held biannually. The date of the next convention was set for June, 1894, at Chicago. But in the period that intervened the brotherhood fell from the height of its prosperity and narrowly escaped utter disintegration.

Everything seemed thriving when the 1892 convention adjourned. Before the end of that year two important working-agreements and wage-scales were secured. By the beginning of the summer of 1893 the number of lodges had increased to 160, and the membership to about 10,000. Then rose the storm that almost obliterated the brotherhood.

The American Railway Union, under the leadership of Eugene V. Debs, the socialist, made its appearance in the labor world in June, 1893. Many will remember the extraordinary rapid growth of this union from the start. Thousands of members of the railway labor organizations forsook their own orders to join the union.

On the formation of the American Railway Union, Mr. Keliher, who had been grand secretary-treasurer of the brotherhood since 1890, resigned and became the general secretary of the Railway Union. Frank L. Ronemus, the originator of the idea of the Carmen's Brotherhood, was elected to fill the post that had been vacated.

When Mr. Ronemus was installed as grand secretary and treasurer of the brotherhood the cash assets of the brotherhood were about $420 and its outstanding liabilities about $1,100. Hardly a day passed in which one or more lodges did not send in their charters and announce that they were going

out of existence in order to join the American Railway Union.

A meeting of the grand executive board of the brotherhood was called and held a long session. The entire clerical force was dismissed, and when the board adjourned Grand Secretary-Treasurer Ronemus had only $32 left in the treasury. Only 38 of the 160 lodges were left. The rest had relinquished their claims to the brotherhood.

The members of these remaining lodges were doubtful of the future of the organization. A few of them continued to pay their per capita tax, but this was quickly consumed in paying office rent and for the publication of the *Carmen's Journal*. The periodical was temporarily suspended in June, 1894, for lack of funds.

The first biennial convention of the Brotherhood of Railway Carmen was held in the Revere Hotel, Chicago, on June 12, 1894. It was a depressed meeting. The American Railway Union held their first annual convention on the same date, in Uhlich's Hall, in North Clark Street, almost directly across the way from the brotherhood. The Union gathering was buoyantly enthusiastic.

F. A. Symonds, of Texarkana, Arkansas, became grand chief carman, and Frank L. Ronemus was reelected grand secretary-treasurer. During the latter part of 1894 and the early part of 1895 more lodges of the brotherhood dropped by the wayside. The headquarters of the grand lodge had been changed from Chicago to Kansas City by the 1894 convention.

Soon afterward the lodge at Kansas City succumbed, and Ronemus was left practically alone. A few lodges still remained. One was the first organized at Cedar Rapids. It advanced twenty-five dollars to the grand secretary and treasurer to pay current bills.

All matters were left to the discretion of Frank L. Ronemus. He had only himself and a little daughter to support, and lived as best he could. In December, 1894, he asked permission of the executive board to move the office effects to his mother's home at Cedar Rapids, as this would eliminate office rent. The request was granted.

Ronemus secured such temporary employment as he could in Cedar Rapids, and in this way existed during the winter of 1894 and the summer and winter of 1895. He performed the office work of the grand lodge at night and on Sunday. Now and then there was a bright spot, such as when Fort Worth Lodge No. 23 advanced twenty-five dollars to tide over a trying two weeks in the early part of 1895.

Ronemus Makes Gallant Fight.

This state of affairs continued through 1896 and 1897. When times appeared to be improving Grand Secretary and Treasurer Ronemus removed again to Kansas City where he secured work as car-inspector and repairer at the Armour shops.

The lodges continued to disband from time to time, but despite this Ronemus organized a few new ones.

In October, 1896, a convention was held in Dallas, Texas. Only seven lodges were represented. The outlook was anything but bright. W. H. Ronemus, the founder of the first lodge of the order, was elected grand chief carman; D. B. Kane, Fort Worth, Texas, vice grand chief, and F. L. Ronemus, grand secretary treasurer.

The grand secretary-treasurer continued to work as car repairer and promised that when he had accumulated one hundred dollars he would give up his place in the shops and take the field as an organizer. During the early part of 1897 a few lodges were instituted by correspondence, through the efforts of the Ronemus brothers.

A little later the one hundred dollars had accumulated and he abandoned his job. He organized four lodges before the one hundred dollars were spent, and on returning to Kansas City found a number of encouraging reports. He owned some property in Iowa, sold it, and with part of the proceeds resuscitated the *Railway Carmen's Journal*, which reappeared in June, 1899, and contained sixteen pages. He personally assumed all responsibilities for the publication.

The brotherhood began to grow after the issue of the first number. At first there were but three hundred members in good standing. By September 8, 1899, when the sixth convention of the

brotherhood was held in St. Louis, there were 1,000. At this meeting W. H. Ronemus was reelected grand chief carman; N. G. Eaton, vice grand chief, and F. L. Ronemus, grand secretary-treasurer.

During the next biennial period an organizer was in the field part of the time, confidence was restored, and the funds began to accumulate so that something could be done to improve and enlarge the *Carmen's Journal*. At the seventh convention, held at Kansas City, Missouri, in September, 1901, the number of members represented was 4,950.

The following staff officers were chosen at this meeting: grand chief carman, J. B. Yeager, Sunbury, Pennsylvania; first vice-grand chief, W. C. Allen, Roanoke, Virginia; second vice-grand chief, Z. T. Seymour, Denver; third vice-grand chief, A. J. Ross, Yoakum, Texas; grand secretary-treasurer and editor and manager of the journal, Frank L. Ronemus.

Wins Fight for Better Wages.

The grand executive board included: W. F. Luffman, Dallas, Texas; T. H McLees, Columbus, Ohio; Frank Hall, Missouri Valley, Iowa; John W. Watts, Paducah, Kentucky, and V. B. Dunkum, Pine Bluff, Arkansas.

The eighth convention was held at St. Louis, Missouri, beginning September 8, 1903. By that time the membership had grown to 19,283. During the previous two years several important agreements were made between the brotherhood and some of the large railway systems. At this convention the ladies' auxiliary, the Loyal Star, was launched, and a joint protective board system was adopted.

The number of vice-grand chief carmen was increased from three to five, and the office of grand chief carman, for the first time since 1894, was made a salaried and active position. The office of editor and manager of the journal was made distinct from that of the grand secretary-treasurer. Frank L. Ronemus was elected grand chief carman.

The order grew steadily in membership and strength. At the 1905 meeting a resolution was adopted providing for the settlement of all differences between the brotherhood and the railways by a board of arbitration. At the 1907 convention the titles of the grand lodge officers were changed. The present staff of the executive officials is as follows:

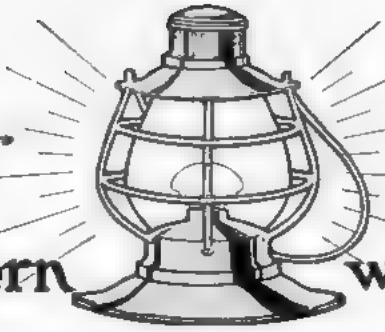
General president, Martin F. Ryan, Kansas City, Missouri; first, second, third, fourth, and fifth general vice-presidents are Frank Paquin, Chicago; Alfred Chartrand, Montreal; J. H Spelts, Denver; John J. Gallagher, Readville, Massachusetts, and John J. Suthons, Rochester, New York, respectively. The general secretary and treasurer is E. William Weeks, Kansas City, Missouri; editor and manager of the journal, W. J. Adams, Kansas City, Missouri. The general executive board includes Frank Hall, chairman, Logan, Iowa; G. F Mounts, Kansas City, Missouri; G E. Webster, Nashua, New Hampshire; C. E. Whitlow, Fort Worth, Texas, and M. B. Wilhelm, Richmond, Virginia.

The present membership of the brotherhood is more than 40,000. F. L. Ronemus, the past general president, still lives at Kansas City, Missouri, and his brother, William H., is at Mena, Arkansas. The latter is the chairman of the Loyal Star orphan home building committee. The brotherhood has an insurance department, known as the Carmen's Mutual Aid Association, which provides certificates of insurance in the sums of $250, $500, and $1,000, payable in the event of death or permanent disability. This department is mutual and optional with members. At present it has more than 1,000 members.

The Loyal Star, the ladies' auxiliary of the brotherhood, was organized on September 14, 1901, at Kansas City, Missouri. Its first officers were: president, Marie L. Ronemus, Kansas City, Missouri; vice-president, Lulu B. Upton, Kansas City, Kansas; secretary-treasurer, Ada Peters, Denison, Texas. Executive board: chairman, Mary E. Mounts, Kansas City, Missouri; Mary A Seymour, Denver, and Lulu B. Upton, Kansas City, Kansas.

One of the objects of the Loyal Star is to build and maintain a home for disabled carmen and their disabled wives and orphan children. This work is progressing actively. The Loyal Star now has 47 lodges throughout the United States and Canada and a membership of more than two thousand.

By the Light of the Lantern



Ask us what you want to know

WE want to be as useful as possible to our readers, but, because of the great popularity of this department, we are obliged to impose certain restrictions. It is limited to the answering of questions of an informative, technical, or historical nature only. Letters concerning positions WILL NOT be answered. All letters should be signed with the full name of the writer, as an indication of his good faith. We will print only his initials. The editor begs that readers sending in questions will not be disappointed if the answers do not appear as early as expected. Delays are often unavoidable for two reasons: the magazine is printed two months in advance of the date of issue, and it frequently takes weeks to secure correct answers, owing to the complexity of the questions.

H. L. F., Bristol, Connecticut.—The New York, New Haven and Hartford Railroad, including the Boston and Maine, operates 6,480.77 miles. The mileage of the Boston and Maine is 2,242.80 miles. The New Haven rolling-stock consists of 1,225 locomotives, 39,369 freight, 2,451 passenger, and 520 miscellaneous cars.

(2) The Boston and Maine is under the direct control of the New York, New Haven and Hartford, C. S. Mellen being president of both.

(3) The best time is made between New York and Boston, 232 miles in 5 hours, averaging 46.4 miles per hour. This includes a five-minute stop at Providence, Rhode Island, and others of the same duration at New London and New Haven. There is also another stop at Stamford on the New York division, where the steam locomotive is abandoned for the electric engine.

V. S. P., Rathdrum, Idaho.—As we have before advised in this department, there are no women locomotive engineers in this country, or any other so far as we can learn. A moment's reflection should convince you that the job is only suitable for a man, and with the power-plants on wheels which are running now, a pretty sturdy man at that.

H. E. R., McPherson, Iowa.—Abandon the idea of working as a telegraph operator in either South America or England. While you might have the necessary experience, as the work is quite similar to our methods, don't forget the low wages. The writer knows that many of them are getting less than $8 per week on English railroads, and in South America the equivalent of $50 per month in gold would be the limit. These foreign countries are bad for American railroad men in the train-service, but infinitely worse for operators, clerks, and the lesser compensated positions. Read the article by N. J. Paterson in this issue. Although it is not directly in your line of work, it may open your eyes to the folly of leaving home.

WILL a car in an ordinary freight-train with a flat side of two inches on one wheel make the ordinary speed, and when the term "flat wheel" is used, how much or how long is the flat side? J. M., Newport, Rhode Island.

The speed could be maintained under the conditions mentioned, but the wheel would not be continued in service, as it would cause destructive shocks to the truck under which it was running, not to mention liability of damage to rails and bridges. The ordinary flat wheel is not flattened over two inches, but, of course, in exceptional cases much longer spots are found.

J. O. M., Houston, Texas.—The two railroads which you mention might employ men in the maintenance-of-way department and in several others without the preliminary of a medical examination, but you will no doubt find on further investigation that this does not apply to positions in the train-service.

L. D., Montreal, Quebec.—We fail to locate the "N. O. N. W.," although it may be a part of the Missouri Pacific system as you suggest. It does not appear, however, in the group of roads included in that system. These are given by the Interstate Commerce Commission bulletins as follows: Arkansas Cen-

tral Railroad Company; Missouri Pacific Railway Company; Natchez and Southern Railway Company, and St. Louis Iron Mountain and Southern Railway Company

(2) The *Railroad Age Gazette*, the *American Engineer*, and *Railway and Locomotive Engineering* are published in New York City, and we think are those to which you refer in your question

L. J. C., Oneida, New York.—The "C., B and W." railway has finally been unearthed through information furnished by a correspondent in Kellyville, Oklahoma, who states that there is such an initialed road, the Cincinnati, Baltimore and Washington. It is the track from the Cincinnati, Hamilton and Dayton road through Mill Creek Valley to Spring Grove Junction, Hamilton County, Ohio. The Baltimore and Ohio Southwestern and the "Big Four" use the track under lease

W. C. R., Pontiac, Michigan.—The fastest train running *into* Chicago is the Twentieth Century Limited of the New York Central lines, covering the distance from New York, 964 miles, in 18 hours, or at an average speed of 53.5 miles per hour

(2) Under the prevailing arrangement a passenger-brakeman, or trainman, does not become a passenger conductor until he has passed through the freight-service. He is eligible for promotion to collector, and on some roads to baggage-master, but can go no higher unless he elects to go around the other way. This is the plan followed on the Erie Railroad and is no doubt representative of the general situation.

(3) Electric-lighted cars are provided with storage-batteries for use when the dynamos are out of service

(4) Don't think there are any compounds on the passenger-trains of the Grand Trunk, unless they are of the balanced type.

(5) There are so many roads using electric locomotive-headlights that the list would be too long for this space. Prominent among them may be mentioned the Atlantic Coast line, Southern, Santa Fe, Southern Pacific, and many others.

(6) Quite a number of roads employ women in the capacities of station-agents and operators. We don't know just why the road you mention employs one at the particular point you mention, and it is rather too intimate a question to ask them

B. C., Alliance, Nebraska, and G. W., Jacksonville, Texas.—You are perfectly right in your train-order decision, but we note that you agree with us in the advisability of asking for something on 129 at Welch, although not as a necessary procedure. It is impossible to be too careful in situations as outlined in the original question.

J. H. P., Albany, New York.—We have referred your questions concerning the electric locomotives used on the Pennsylvania, New York, New Haven and Hartford, and on the New York Central to the proper officials and hope to reply in the next issue. In regard to the most powerful Pacific-type engines operated by the New York Central, those numbered from 3400 up—for instance, No. 3426—have that distinction. This locomotive exerts a tractive-effort of 30,000 pounds, 200 pounds more than the class K-28 Pacifics of the Pennsylvania Railroad, although exceeded by them both in total weight and in weight on drivers. The total weight of the 3426 is 269,000 pounds, and of the K-28 class, 272,500 pounds. About 14 inches is generally regarded as the limit of height for an object lying between the rails to clear the under works of a car, and about 8 inches for an engine pilot.

R. J. P., Kanona, Ontario.—The speed of the Twentieth Century Limited between Elkhart, Indiana, and Toledo, Ohio, is 60 miles an hour; otherwise, 133.4 miles in 133 minutes This is the fastest spurt of all the famous limited trains of the United States The one nearest approaching it is the Pennsylvania Special, No. 29, between Jersey City and Harrisburg, 188.4 miles in 193 minutes, which, exclusive of stops, is a rate of 58.6 miles an hour.

W. E. R., Julian, Nebraska. Your questions in regard to the intermediate sidings on the Big Four had best be addressed direct to George P. Smith, chief engineer, Cincinnati

W. L., Waterloo, Iowa.—If a regular train should have to run backward from one division point to another, the markers should be taken from the rear coach and displayed on the front end of the engine, presuming, of course, that it was backing up with the train

B. S. C., Fort Morgan, Alabama.—Your questions are not altogether clear, but it would appear, from the comparatively low steam-pressure mentioned, 150 pounds, that in 20 inches diameter you are overcylindered in the high pressure. You do not state whether a two-cylinder or four-cylinder compound is meant. If the former is the case, about 18 inches would be the limit in diameter for the high pressure, and with the low as great as the clearance along the line will permit. There

are no standard rules for working out these relative proportions. If you will write us again, stating whether you refer to a locomotive, and how many cylinders, we will give an outline of the calculations generally employed in determining their dimensions.

W. A. R., Houston, Texas.—Address the secretary of the Isthmian Canal Commission, Washington, for full information in regard to service on the canal

H. D. S., Waycross, Georgia.—Address the secretary of the Interstate Commerce Commission, Washington, for printed matter relative to the safety-appliance law

COULD a broken top gage-cock, broken just at the boiler-head, be repaired, without killing the engine—R. B. H., Big Lake, Wisconsin.

It might be possible to plug it, but hardly likely until the steam is blown from the boiler. The hole in the gage-cock is very small, but it is ample to fill the cab with scalding vapor, especially with 200 pounds pressure behind it. The steam may be blown off through the steam-chest relief-valves without dumping the fire as a preliminary, but care should be taken to keep the injector working so that the water level will not be dangerously lowered

E. D., Lone Tree, Iowa.—In the effort to find a substitute for wooden ties a number of different forms of steel, concrete, and reinforced concrete ties have been patented. The different designs may be found described and illustrated in any standard work on railroad track construction. For instance, we might recommend Wilson's "Elements of Railroad Track and Construction."

According to this book the use of steel ties is in the experimental stage in this country and the data is very hard to obtain. In regard to concrete ties some experiments show this form to be a failure when placed in stone ballast under heavy traffic. In reinforced concrete ties the concrete shows a tendency to break away from the steel, and it is also difficult to keep the fastenings in the tie from working loose. There is a good field still open to inventors, and if you have something new, as your letter suggests, we advise you to follow it up

G. N., South Range, Wisconsin.—Why a cross-compound won't drift freely, seems to be the natural perversity of the "critter." Many reasons are assigned for it, but the most logical seems to be compression which the cylinder and steam-chest relief valves do not take care of, either from insufficient capacity or need of repair. Better crack the throttle a little when drifting and the trouble will disappear.

(2 and 3) We do not find any record of Mallets and Mikado engines on the Soo Line. The other road mentioned has no cross-compounds.

(4) Write the Westinghouse Air-Brake Company, Wilmerding, Pennsylvania, and the New York Air-Brake Company, Watertown, New York, telling them what you want, and they will each no doubt supply you with some of their literature. *Railway and Locomotive Engineering*, 114 Liberty Street, New York City, deals in books relating to air-brake and locomotive construction in general.

PLEASE explain why they equip every engine which goes through the back shop with a ¾-inch bar across the exhaust-nozzle—F. L., Portland, Oregon

They do not. It is far from being a universal practise, although it may prevail in your section. The idea, however, is simply to spread the exhaust steam to fill the stack so that the engine will burn her fire and consequently steam better. It is one of the old-time remedies and is often effectual. There are objections which cause the use of the "bridge" to be forbidden by many mechanical superintendents. A bridge placed in a single nozzle has the effect of reducing the area and increasing the back pressure in the cylinders. Spreading the steam to fill the stack in this manner has the effect of further increasing the back pressure, as it has been found that reducing the "choke" or small diameter of the stack caused back pressure the same as reducing the nozzle. Bridging a nozzle is usually creating one defect to remedy another

R. L. R., Salem, Oregon.—If you are under age, we suggest that you work in the shop as a helper, if the rules of the road permit. You will have to learn the fireman's work on the foot-plate of the engine, however, and will not draw any money until you qualify.

WHAT is a side-rod stub?

(2) What is a cylinder-saddle?

(3) What is the Nickel-Plate Road?

(4) What is meant by a valve "overtraveling"?

(5) What is the Allen valve, and how is it different from the ordinary?

(6) What is eccentricity and angular advance?—H. P. M., Norman, Oklahoma

(1) The enlarged and rounded part at the end which is bored to receive the bushing.

(2) The straight parallel sides of the cylinder which unite it to the smoke-box. The top

of the saddle is cast so that it can be readily chipped to fit the circle of the smoke-box.

(3) New York, Chicago and St. Louis Railroad

(4) Properly, it should be taken to mean great valve travel, but the term is quite commonly used in referring to an engine with valves "out of square," and where the tram marks indicate that the valve is traveling further on one end of the seat than on the other, which we think is what you mean. If, however, you mean great valve travel, this condition chokes the exhaust, increases the sharpness of the cut-off, and retards the compression and release. It is sometimes necessary when it is desired to give plenty of port-opening at early cut-off, in which case other points have overtravel.

(5) In the Allen or Trick valve there is a step or shoulder on the valve-face and a passage through the valve itself in such fashion that, as the outside edge of the valve at either end commences to uncover the steam-port at one end, the supplementary passage commences to receive steam at the other, and passes it over to be discharged into the same port beside the stream of steam coming in by the outside edge of the valve. This valve is most needed at high speed, where the valve-travel is shortest, giving double the opening with a given valve-travel

(6) Eccentricity is the distance from the center of the axle and that of the eccentric sheave It differs from the throw, because the throw is twice the eccentricity. Angular advance of an eccentric is the angle which a line drawn through the center of the axle and center of the eccentric makes with a vertical line also drawn through the center of the axle when the crank is on one of the dead points or centers. In order to give the valve the necessary lead the eccentric must be moved back of the vertical line

G. E. T., Joplin, Missouri.—A long search fails to reveal the road mentioned. Why not inquire direct of one of the passenger or freight-agents of the railroads in Joplin? If the road exists, they will no doubt be able to give you the information

J. H. R., Charleston, West Virginia.—The way your proposition looks to us and to all to whom we have submitted it, is that you have no authority to leave "D" and must remain there until the meet-order is fulfilled

J. B., Schofield Barracks, Hawaii Territory. —From a table issued by the Interstate Commerce Commission, dated January 1, 1908, the aggregate length of lines or parts of lines of railroads in the United States on which the block system was used is 58,678.7 miles. This, of course, included automatic and non-automatic block signals. At that time, with a total of 8,968.2 miles operated by the company (passenger lines) the Chicago, Burlington and Quincy, showed 8,848.8 miles operated under block, or 98.7 per cent.

(2) The C., B. and Q. is still in the lead in the percentage of tracks so operated, except many small lines, of say, 50 or 100 miles, which are one hundred per cent blocked, but they cannot well be compared on a mileage basis with the C., B. and Q.

(3) It is not ordinarily possible for a train to enter a block with another ahead unless through error on the part of the engineer of the following train. Read the articles by Robert H. Rogers in the May and June, 1912, numbers of the RAILROAD MAN'S MAGAZINE on the development and operation of signals. These will give you all the information desired

(4) There is said to be a roundhouse on the Grand Trunk with 63 stalls, but we are somewhat uncertain as to its location. If this is incorrect, however, some obliging reader in that territory will let us know.

(5) Presuming that this question refers to the largest passenger yard, or, in other words, the greatest volume of business handled in a passenger terminal, we offer the following concerning the South Terminal Station of the New York, New Haven and Hartford Railroad, Boston, on summer schedule, the figures representing a daily movement, Sundays excepted

Regular trains, 876; drafts to and from storage yards, 450; light engines to and from roundhouses, 385. Total movements to and from terminal, 1,711

J. L. R., Portland, Maine.—We have no record of the dimensions of the Boston and Maine Pacifics which you mention. H. Bartlett, General Mechanical Superintendent, Boston, will no doubt furnish the information on request, and would suggest that you apply to him direct to save delay

N. E. M., Detroit, Michigan.—The trainmaster of the Canadian Pacific Railway at Calgary, Alberta, is A. N. Hobkirk. The official guide does not give the name of the incumbent of that office on the Grand Trunk Pacific in the same town.

J. N. M., Reading, Pennsylvania.—Only the "crack" trains west of Chicago, such as the California Limited of the Santa Fe, are composed of exclusively Pullman equipment. All the others, which means the great majority, carry day-coaches, and some of them

chair-cars, for the use of which no other charge than the regular fare is imposed

WHAT is meant by inside and outside admission-valves?—C. T. R., Richmond, Virginia.

Valves that admit steam to the ports around the outside edges of the valve are outside admission-valves, and those that admit steam to the ports around the inside edges are inside admission-valves. Piston, or box-valves, are the only valves that are inside admission.

W. E. F., Frankfort, Kentucky.—As you say, there appears to be no agreement between the air-brake companies on the force exerted on the rim of a hand-brake wheel, and we do not find any record of tests to establish it. We are, however, searching through past reports of the Master Car-Builders Association conventions and may possibly be able to present some data in the next issue

WHAT is the effect of a leaky steam-pipe joint in the smoke-box? Is the bad effect due to the amount of steam lost through the leak or to other causes?

(2) Can the boiler of a dead engine be filled by towing her?—O. M. W., Philadelphia.

(1) The amount of steam lost is so inconsiderable that it may be disregarded. The ill effect is due to the leak impairing the smoke-box vacuum. The exhaust steam passing up through the stack expels the smoke and gases from the front end, producing a partial vacuum in it. Air to supply this vacuum must be taken through the ash-pan, grates, hollow stay-bolts, combustion-tubes, and fire-door. If the steam-pipe joints leak, or the joint under the exhaust-pipe, or if the steam from the blower-pipe, exhaust-pipe from the air-pump, are not directed up through the stack, but strike the flare of the petticoat-pipe, or are tipped so that the leak or steam will destroy the partial vacuum, the engine will not steam and the fire will not burn brightly, but with a smoky dull red color.

(2) There are a number of authorities who claim that this can be done, but the writer never saw it demonstrated. The procedure is to plug the cylinder-cocks, relief, or air valves, overflow-pipes to the injectors, and the whistle-valve. Then open the injector-throttle and place the reverse-lever in the direction in which the engine is moving. The idea is to obtain sufficient vacuum to pull the water from the tender through the feed, injector, and branch-pipes to the boiler

Boilers have been filled in this manner when a speed of from 12 to 25 miles an hour could be obtained, in distances of from 6 to 10 miles. There is nothing to be gained by this procedure, because the delays to traffic, trains, and engine-crews more than offset any possible advantage. Don't you think that the more sensible procedure would be to prepare to be towed to a terminal without wasting time in experimenting with such theories?

C. K. H., Chicago.—The Central Vermont Railway is controlled by the Grand Trunk; the Lehigh Valley is an independent road

(2) You no doubt refer to the New York and Florida Special of the Atlantic Coast Line. This train travels from New York to Knight's Key, which lies in the ocean at a point 70 miles south of the southernmost part of the Florida peninsula. The distance is 1,485 miles, and the special makes it in 42½ hours. From Miami, southward, the train runs over a concrete roadway from island to island until it reaches its destination far out at sea, where it connects with the Peninsula and Occidental Steamship Company.

R. C. B., Norwich, Connecticut.—You might address H. J. Horn, vice-president, New York, New Haven and Hartford Railroad, New Haven, in regard to your question in connection with the New England Navigation Company. He will no doubt refer your letter to the proper official for reply

(2) As a rule, the train-conductor collects tickets, but in congested districts, as on the New Haven, between New York and New Haven, and on the Erie, between Suffern and Jersey City, he has the help of a collector This position cannot be secured on any railroad unless one is a trainman. The trainmen who now perform the duties of the former brakemen are promoted to this place. It is useless to apply directly to any railroad for this position

WHAT change in the method of construction of either the engine or the track permits engines of such gigantic size as now being built to round curves and not jump the track? About thirty years ago the Pennsylvania had a very large engine built for its main line which was called "Jumbo" and which jumped the track so easily on curves that it was sent to the Medford branch on the Amboy Division The claim was made that its wheel-base was too long to round curves and stay on the rail at the speed desired.—J. C. N., Holtville, California.

There has been no change made in either of the items which you mention, except, of course, the introduction of the Mallet compounds, which, being articulated, allows each group of driving-wheels to curve independently and permits the use of a very long locomo-

tive. We do not know the rigid wheel-base of the "Jumbo," but unless it was some freak, and the Pennsylvania does not care for freaks, we venture to say that there are engines running to-day with much longer wheel-base and on curves just as sharp. The longest rigid wheel-base is 19 feet, which may be found on the 0-10-0 switchers of the Lake Shore and Michigan Southern, and these engines operate on very sharp curves without derailment.

It may interest you to know that a consolidation engine (2-8-0 type) with 15 feet 6 inches of rigid wheel-base will round a 22 degree curve, this being sharper than any laid down on the main line of any railroad in this country, unless in some exceptional instance. The locomotive was built for the National Lines of Mexico, and had all driving-wheels with flanged tires. In this instance there was a rail spread in the curve of 1¾ inches, but the same practise was followed when the "Jumbo" was running. We would very much like to have the rigid wheel-base of the latter, and whether it had plain or flanged tires. With this information it would be possible to properly reply to your question, provided the degree of curvature of the sharpest curve is also available. Possibly you can give us an idea of the wheel-base of the engine.

T. N., Carbondale, Illinois. An engineer is required to be familiar with all signals used on the railroad; hand, lamp, bell-cord, steam-whistle, fixed block, and any others. To give the full list is far too long for this department.

(2) Note reply to "R. J. P.," Kanona, Ontario, in this issue.

H. R. S., New York City.—There is no road in this country where passenger-trains are weighed at certain intervals along the road. There would be nothing in this with the object of preventing overloading, as your letter suggests, because it is practically impossible to overload passenger-equipment of modern construction.

G. W. V., Douglas, Arizona.—The correct procedure is indicated in the answer to "O. M. W.," Philadelphia, in this issue. The cylinders cannot be converted into air-pumps, as you will note that everything is supposed to be carefully plugged about them. The writer has never seen the experiment attempted, but there is good authority among old railroad men for the statement that the boiler can be filled in this manner.

F. A. del R., Aguirre, Porto Rico.—Address John Wiley & Sons, 43 East Nineteenth Street, New York City, New York. If books of the kind requested are in print, this firm can procure them for you.

WHERE can I obtain a representative schedule of agreement governing working-hours, wages, etc., which, I understand, is entered into by the railroad companies and their engineers and firemen?—F. B., Cumberland, Maryland.

These agreements are regarded as private, or at least semiprivate, and unless the division chairman of either of the brotherhoods cares to give you a copy there is scarcely any other way to obtain one. If you have a friend in the train-service he would probably loan you his, if you are merely curious to know how they are drafted.

H. L. N., Baltimore.—One gallon, United States standard, contains 231 cubic inches, and weighs eight and one-third pounds, therefore the weight of water in your 8,000-gallons-capacity tank is approximately 66,660 pounds.

WHAT is meant by the term "ton-mile?" (2) What are track-tanks?—G. K. S., Johnstown, Pennsylvania.

(1) It means one ton hauled one mile. A thousand ton-miles is one ton hauled 1,000 miles, or 1,000 tons hauled one mile, or any combination of tons and miles whose product is 1,000, for instance, 10 tons, 100 miles; 25 tons, 40 miles; 40 tons, 25 miles.

(2) These are shallow steel tanks of about three-sixteenth-inch steel, 7 inches deep and from 1,200 to 1,500 feet long. The upper edges are stiffened by half-round iron. The scoop from the locomotive tender is lowered into the trough either by manual effort or through a compressed-air arrangement, and water is generally taken at a speed of about 35 miles an hour. The system was invented by J. Ramsbottam, in England, in 1861.

C. K. T., Philadelphia.—You should secure every copy of the RAILROAD MAN'S MAGAZINE, as it is impossible to reprint articles that have already appeared. An illustrated article describing the most dangerous railroad line appeared in the July, 1912, number. "Our Busy Switchmen" was published in the August, 1912, number.

F. J. B., Portage, Maine.—The title "railway king" was bestowed on George Hudson—born 1801; died 1871—of York, England, whose railway speculations were among the most daring of modern times. After amassing great wealth, he became involved in the railway panic of 1847, and lost the greater part of his fortune.

FRESH AIR FOR UNDERGROUND RAILWAYS

E. P. Grove, Chief Engineer of London's "Tuppenny Tube," Seems to Have Successfully Solved an Important Problem.

BY FREDERICK A. TALBOT.

I ONCE heard a traveler on the New York Subway, who was mopping his brow feverishly in the sweltering summer underground atmosphere, describe the tunnels as "hell with the lid on!"

The description was picturesque and to the point, but it is not peculiar to the New York system by any means. I found the tunnels of the London electrical railways, and those of Paris, every whit as bad as those of New York, although possibly the New York system may be fiercer in summer.

The adequate ventilation of these subterranean lines of communication constitutes one of the problems confronting the engineer. It cropped up first when the Central London Railway, or "Tuppenny Tube," was laid from eighty to one hundred feet below the street level. It was unavoidable, seeing that this system works upon the shuttle principle with a dead end. It is underground throughout the whole of its seven and one-half miles, laid in two tubes—for the up and down traffic respectively—with cross-overs here and there, and with one end only open to the air.

Exhaust Fan of 200 Horse-Power.

Under these circumstances it was by no means an easy matter to secure the adequate ventilation of the tunnels, and the introduction of fresh supplies of pure air at frequent intervals.

The problem was complicated by the fact that as the railway handles 40,000,000 passengers a year, and that a service of forty trains an hour is maintained during the heaviest periods of traffic. Consequently the fresh air became vitiated very speedily, so that before the day was far advanced the atmosphere within was depressing and heated, owing to the high proportion of carbonic acid gas.

Frustrated in their efforts to maintain ventilation during the day, the railway took advantage of the two or three hours in the night when traffic is ordered suspended by the Board of Trade regulations, to permit track inspection and other overhauling work. When these duties were completed the various connections with the streets leading from the stations were closed, thus sealing the two tubes. At the Shepherd's Bush terminus, where the line emerges into the open air, a huge exhaust fan of 200 horse-power was fixed. By this means the atmosphere which had become vitiated during the day was exhausted, and the tunnels recharged with a supply of fresh air for the next day.

These expedients, however, were far from satisfactory, so the engineers decided to try the effects of an ozonizing installation, to inject the invigorating air into the tubes at frequent points continuously throughout the day.

Ozone Is Generated.

Mr. E. P. Grove, engineer-in-chief of the railway, made a series of experiments, and at length a practicable plant was elaborated, which is now in operation at every station with the exception of the western terminus, which is in connection with the open air.

This plant has settled down to its stride, and has proved a complete success, so that now the problem of ventilating underground railways may be considered solved.

The solution, however, bristled with many peculiar difficulties. Foremost among these was the conduction of the purified, invigorating air to the platforms and tunnels from the street levels above, and its association with the vitiated atmosphere at a depth of one hundred feet, owing to the elevators, twists, and bends in the approaches to the platforms, so as to permit the fresh air to circulate freely.

The ozone generating apparatus occupies a small space near the street level, be-

ing placed in a cubicle in the booking-hall. The air is drawn from the outer atmosphere, but being heavily charged with smut and other deleterious matter inseparable from such a city as London, is first passed through a filter, which cleanses it of these impurities and absorbs the sulfuric acid, sal-ammoniac, and other noxious gases.

The filter comprises a screen, which is kept moistened by a continuous flow of water issuing from a series of jets arranged along the upper edge. The air is sucked through this liquid curtain by means of a fan driven at a high speed by a powerful electric motor.

After being washed, the air is passed into a mixing chamber, where it is purified and partially sterilized by the aid of ozone. The ozone generator comprises a series of ten generating units, each comprising a thin mica plate, with a sheet of metallic gauze on either side, the set of ten plates being spaced and mounted on insulating supports.

The gauze sheets are connected across the secondary of a small transformer, delivering alternating current at a pressure of several thousand volts. An innumerable number of minute discharges occur all over the opposing surfaces of the plates.

Owing to the large volume of air which is handled, a comparatively strong mixture is produced in the generator, and this is conveyed to the mixing chamber of the main ventilating fan, where it is broken down by association with the main volume of incoming air.

Just Like a Sea Breeze.

Thence it is led to the circulating trunk and forced to the platforms below, finally escaping through distributing ducts spaced along the platforms where most required.

The distributing conduit has its opening about seven feet above the floor of the platform, so that the ozonized air has a free escape above the heads of the passengers, and in such a manner that no drafts are created.

The majority of the equipments pass normally some 360,000 cubic feet of air per day, and the generator provides a volume of ozone sufficient to preserve the correct proportion of sea breeze to air. This ratio may be varied as desired, to meet fluctuating conditions, from the switchboard of each equipment.

The ozone generator is supplied with current at 5,000 volts from a transformer fed at 380 volts alternating current, from a small 550 volt rotary converter. The design of the latter presented many difficulties, as it was essential to secure a type of small size and high direct current voltage to work satisfactorily. The main circulating conduit in the majority of cases is driven by a ventilating fan actuated by a 7½ horse-power motor.

The plants so fitted deliver from 5,500 to 6,500 cubic feet of air every minute, but the installations at two stations are designed to deliver 15,000 and 10,000 cubic feet per minute, respectively, the former larger plant being necessary owing to there being no installation at Shepherd's Bush terminus.

Altogether the various plants deliver a total of 80,000,000 cubic feet of ozonized air into the tunnels during every working day.

Complete Circulation Insured.

The main ducts in the case of the normal equipments are about three feet square in cross section, and are built up of mild galvanized steel. The shape of the section is determined by the space available in each particular case. In some passages it is circular, in others rectangular, and in more than one instance the duct has been constructed with a segmental section, so as to fit into the upper portion of the tubular approach.

While the stations receive the greater proportion of the ozonized air, a certain volume is discharged into the tunnels. It was impossible to provide discharge ducts in the tubes themselves upon the lines followed in regard to the platforms, so another simple system was adopted.

Two large branches from the main distributing duct are carried forward into each tunnel—up and down—for a distance of about forty feet from the end of the platform in the direction in which the trains run. The passing train traveling in the same direction as the discharge duct, strikes the cushion of air, which is discharged into the tube and draws it as far as the next station. Seeing that the service is about forty trains an hour during the busiest times of the day, a complete circulation of the air through the tubes is insured. Of the total volume of ozonized air pumped into the tubes, about one-third is distributed over the platform areas, while the balance is discharged into the tunnels.

The installation of this system has resulted in a marked improvement in the atmosphere of the railway. The air is cool, being practically uniform the year round, and is as fresh, pure, and bracing as the breezes along the seashore. The success of this development offers a convincing solution of the problem of efficiently ventilating underground railways.

UNCLE SAM'S FOUNDRY FOR ACCURACY.

The Bureau of Standards Is an Elaborate Government Institution Which Exists Solely to Make Weights and Measures Absolutely Exact.

BY RICHARDSON DAVENPORT.

HOW much is an inch?

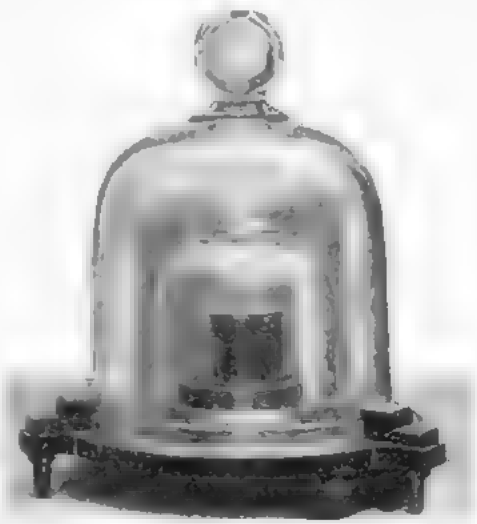
How long is a mile?

It would seem that these questions are either very foolish or that they are very easy to answer. As a matter of fact, very few people can answer them, and so far from being foolish questions, a very large and elaborate equipment is maintained by the government in the Bureau of Standards to answer these and similar questions.

Although the points of contact between the railways and the Bureau of Standards are many, and while most of these points are important, none of them has so far-reaching an effect as does this one which concerns measures of length. Without a standard of length neither gage nor length of track, speed of train, nor size of wheels could be determined. Though the men who build railways and make the rolling stock may never have heard of the United States prototype meter, it determines the size of everything they make, the actual dimensions of everything they construct.

In the Bureau of Standards at Washington is a vault. In the vault is a glass case. In the glass case is a fiber case and in the fiber case a rod of peculiar cross section. This rod has near each end some almost invisible hair lines engraved upon it. The distance between them is exactly one meter.

"Exactly means within the comprehension of the ordinary means of measurement. As a matter of fact the distance is slightly less than one meter, the difference being about *one and a half millionths of a meter*—an error so small that the most delicate means of measurement known to science is required to discover it.



UNITED STATES PROTOTYPE METER, WHICH DETERMINES THE SIZE OF EVERYTHING THE RAILROADS MANUFACTURE. THIS REMARKABLE BASIS OF ACTUAL DIMENSION IS KEPT INSIDE OF TWO GLASS CASES IN A VAULT OF UNCHANGEABLE TEMPERATURE

This is the prototype meter of the United States

—the last ultimate standard of length for this country from which all our measurements are derived. It is the measurement of length from which is determined our inch, our foot, our yard, our rod, our mile, and, of course, all the measures of length of the metric system. The railway builder with his steel tapes, his surveying instruments, and his gages may not know it, but the measurements he makes all originate from the prototype meter at the Bureau of Standards.

The Wonderful Prototype.

The prototype meter is the result of years of labor of an International Bureau of Weights and Measures, with headquarters near Paris, and each of the other countries contributing to the support of this bureau has also a prototpye meter. This country has two, the other one being exactly similar to the prototype meter, but not kept quite so closely guarded, because it must be actually used

The surveyor for a railway buys steel tape from a manufacturing plant which makes it. The manufacturing plant has a standard measure, which it has sent to the bureau to be compared with the standard meter. The bureau makes the comparison and the railway measures inches of gage and miles of track from its steel tape copy of the copy of the standard meter, which is itself a copy of the prototype meter, which is exactly like the international prototype meter in Paris, which in its turn is just like the standard meter of the Archives of France, which is the ultimate standard for the whole world!

The way in which the comparison is made at the Bureau of Standards is very interesting. Naturally, the meter bar is of different lengths at different temperatures. It is only of the true length when at the temperature of melting ice.

When it is to be used to make a comparison it is immersed in a trough full of melting ice. This trough is in a long tunnel. The trough is slid along on standards on a track and two microscopes on stone pillars are adjusted over the bar so that the faint lines near each end of the bar, which indicate its meter length, are directly between cross-hairs in the microscopic field of view.

This accomplished, the meter bar, in its melting ice bath, is moved along so that the end which was under the *first* microscope is now under the *second* microscope—a *third* microscope on a stone pillar is adjusted so that the lines on the end of the bar are properly centered in *its* field of view. This process is repeated until the sixth microscope is reached. The distance between the first and the sixth microscope then, is exactly five meters.

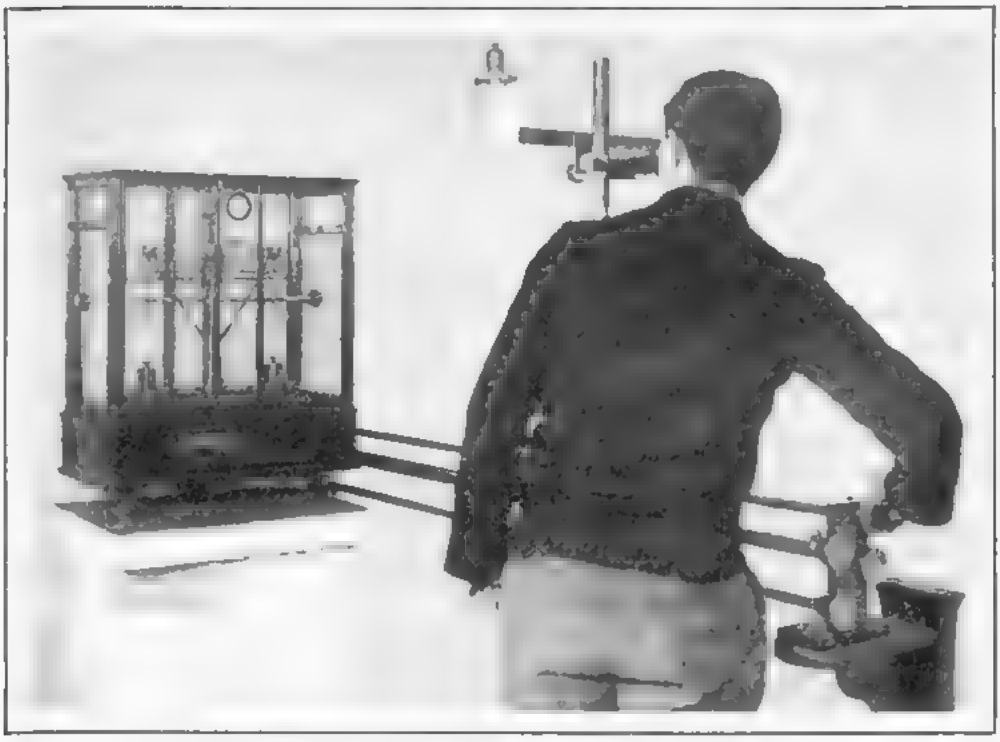
Another bar is then brought into use, and its length, supposedly five meters, is compared with the five meter microscopic distances. The longer bar is now adjusted under successive microscopes, until the chain reaches a length of fifty meters, from which long tapes can be accurately compared. As a matter of practise, long steel bars, supported on rollers at one side of this subterranean tunnel, are used for correcting most steel tapes, being periodically compared as to the lengths of the divisions marked on them, with the original meter and its multiples.

To make the comparisons at a known temperature, the long tunnel is provided with many feet of radiating surface of pipes, which may be filled either with steam to raise the temperature or cold brine to lower it.

Value To Railroads.

Not only for the measure of length but also for its measures of weight does the railway depend on a standard in the Bureau of Standards vault. When the railway buys a ton of coal, or steel rails of so many pounds to the yard, it depends on the accuracy of weights, which have their standard in this vault

Scales makers of all kinds have their own standards, but to be accurate and to be legal, those weights must be standardized either with the official weights of which each State has a set of those of the Bureau of Standards, of which the State weights are copies. Almost all the scales makers send their standards to the Bureau of Standards for comparison and correction, a work which the bureau is particularly fitted to undertake, because it is equipped not only with the standards themselves, but with balances of marvelous delicacy.



THIS BALANCE USED BY THE BUREAU OF STANDARDS IS THE MOST DELICATE SCALES IN ALL THE WORLD. THE OPERATOR STANDS AT A DISTANCE OF TEN FEET FROM THE CASE ENCLOSING THE MACHINE IN ORDER THAT THE HEAT OF HIS BODY MAY NOT AFFECT IT IN ANY WAY. THIS BALANCE WILL WEIGH THE SMALLEST PARTICLE OF MATTER

There is no particle of matter divisible by mechanical means so small that it cannot be weighed on one of these delicate balances. So delicate are they, that they can measure the difference in the pull of gravity on two weights placed side by side, and the same two weights placed one above the other. In the latter case, of course, one weight is further from the center of the earth than the other and consequently is subjected to a less pull The difference is minute, but these balances measure it.

The balances, protected from dust and air currents by glass cases, are so extremely sensitive that the heat of the body of an observer would affect them Consequently, when comparing a standard weight with a prototype standard for, let us say, a scales company, the observer stands some fifteen feet away from the scales and manipulates them through the glass case by long jointed rods controlling the mechanism

The scales is read by means of a microscope. The weights themselves are not handled with human hands at all, but after being placed on the pans of the scale by tongs and left a day to allow air currents in the case to cease and for temperature adjustments, are picked up and moved about inside the scale case entirely by mechanical hands which transpose them and dispose of them with quite uncanny mechanical skill

In this connection, the proposed work of car-scale investigation which the bureau is taking up, is of great interest to railroads. As it is at present, railroads have their own test-cars to test car-scales, and to assure shippers of the accuracy of these huge pieces of mechanism that weigh in tons where a delicate balance weighs in milligrams

One man from the Bureau of Standards is now devoting his entire time to car scale investigation, and it is hoped that the work may be done more extensively in the near future and an appropriation secured which will permit the building of an official test-car for the purpose of testing car scales throughout the country

and assuring the general public that these mechanisms are absolutely accurate and weigh according to weight standards.

It is interesting to know that the weight of a test-car, designed by railways to test its own car-scales, varies. The variation may be as small as a pound after several thousand miles of travel and may be much larger. It is accounted for, of course, by dust settling on the car, by dust washed off by rain, by rust dropping from metal parts, by variations in the weight of oil in the bearings, etc.

Perhaps the most vital point of contact which the railways have with the Bureau of Standards outside of those fundamental measures of length and weight on which the whole engineering and commercial civilization of this country, as well as the railways, are built, is in the work of Dr. James E. Howard, the Engineer Physicist of the Bureau, as conducted for the Interstate Commerce Commission.

Mr. Howard takes steel rails, gathered up after an accident, and examines them scientifically to determine the cause of rail breakage. In this work he is guided not only by microscopic examinations, of cross sections and polished sections, physical tests of the strength of the rail, and chemical tests for rail composition, but by experience of great length in the work, by, as he calls it, "engineering common sense."

To show the scope and intent of this work, which is of the first importance not only to the Interstate Commerce Commission, and the railways, but to the general public, an example will probably be more illuminating than pages of description.

Investigating a Wreck.

A year ago the Lehigh Valley Railroad had a disastrous derailment near Manchester, New York, which resulted in twenty nine deaths and injuries to sixty-two people. The derailment was caused by a broken rail. All the available pieces were afterward gathered up and sent to the Bureau of Standards by the Interstate Commerce Commission for examination and tests.

Dr. Howard, before making any tests, visited the scene of the accident in order to get first hand details of locality and surroundings, a course always pursued when practical, because the determination of the cause of a broken rail, while it may, as in this case, disclose faults in the steel, may well be caused primarily by some local condition which the examination of the rail itself would not reveal.

On examining the rail after sawing a piece of it in half, Dr. Howard brought out the fact that the web of the rail was "piped." Nevertheless, it was not the piping which primarily caused this accident, though it undoubtedly contributed to it.

It is in this that Dr. Howard's work so clearly demonstrates its value—he was not content to rest with the development of a rail flaw which any one could discover and say that the rail undoubtedly collapsed because it was "piped."

Rails and Speed.

To prove what effect this piping had on the general strength of the rail, Dr. Howard subjected it to a compression test, using a one-inch section of the rail for the purpose. A pressure of 75,420 pounds was used. As this is equivalent to 130,000 pounds to the square inch of rail, the rail showed unusual strength for its "piped" condition.

Examination brought out the fact that the rail had other defects beside the piping. Transverse fissures developed in the rail, some of them much larger and more easily seen than others. Of one of these, Dr. Howard said in his report:

> This fissure extended to the gage side of the head and could be seen on the rolled surface. While this was the case, the line of fracture being visible to the eye, still it was not sufficiently pronounced to attract ordinary observation. Its vagueness in appearance would cast a doubt upon its reality if perchance its discovery had been made in the track. The crack may be seen on the side of the head, but it would be unreasonable to expect its discovery in the track except by accident.
>
> *The detection of such fissures, or rather all such fissures if of frequent occurrence, would be a task practically too great to accomplish under service conditions. The insidious character of these fissures is a most dispiriting feature of the case. Here are fissures of the most dangerous character which embrittle the rail and lead to fracture with out display of ductility in the*

steel and which are so hidden as to practically defy detection under ordinary close scrutiny

But after an exhaustive investigation that included the tests of applied pressure, sawing sections from the rails, polishing and etching them and examining them with minute care, splitting the rail and looking for the evidence of internal strains, slag splits and defects, analysis both of the composition of the rail as a whole and of various parts of it, procuring the whole history of the rail from the time it was rolled to the time it broke, and applying to the wreck as a whole the experience of years and the knowledge of rails and steels which makes Dr. Howard the expert he is, the engineer physicist came to a pertinent conclusion which may result in the saving of many lives. He said:

> Referring especially to the development of the short transverse fissures in the heads of the rails and which are found on the gage side of the head, that they are believed to constitute a grave danger. If, as now supposed, they are the direct result of high wheel-pressures acting on hard steel, then the danger is widespread. The Manchester rail, omitting reference for the time being to the slag split in the web, was fissured in many places. Apparently a number of transverse seams and longitudinal fissures were developed in the track, as the result of a few months' service. The fissures occupied positions in harmony with the explanation of the cold rolling and shearing effect of high wheel-pressures acting on a steel too hard to respond without the development of interior fractures. The effect was necessarily intensified by the bending stresses on the rail from the direct downward loads.
>
> The limit of endurance of iron rails was reached long ago. Train loads and wheel-pressures soon became too great for iron rails to stand up under, and they were replaced by steel rails.
>
> There is undoubtedly a limit to the endurance of steel rails as well as in the case of iron. It is important to ascertain whether the great lesson of the Manchester disaster does not lie in the direction of signifying that the danger zone of steel rails has been reached and possibly entered into by current railroad practises.
>
> If the above explanation is found correct, then the remedy does not consist in increasing the weight of the rail, but in diminishing the intensity of the wheel-pressures and lowering the direct compressive and the bending stresses.
>
> While the Manchester rail was defective in the web, the feature which seems most grave is the general shattering of the integrity of the steel—data on track conditions, such as the actual fiber stresses which are realized under the weights of different types of locomotives and under the different wheels of those different engines in track in ordinary condition, and from the metallurgical end observations on steels of different degrees of hardness.

It is rapidly becoming known among transportation authorities that we are only at the threshold of the rail transportation problems of speed and safety. Hitherto those problems have been confined to means of attaining speed first, and safety next. They have been partially answered with locomotives of immense size and power and with systems of railroad operation and signaling devices.

It is realized that speed brings problems of its own, not concerned with firebox area and steam-pressures—that the safety problem extends far beyond the installation of signaling devices and the elimination of the personal equation in railroad operation.

Testing Electric Lights.

If a slag split in a rail, unseen and unknown, can cause a wreck; if internal stresses in rails are potential murderers of the traveling public, then some means of assuring the integrity of rails must be found.

It is in the investigations of this sort that the work of Dr. Howard's department in the Bureau of Standards is of such great importance, and every investigation conducted by him for the Interstate Commerce Commission adds one more pound to the push which is always toward, not only better rails, but a better knowledge of what rails can stand, and when, as in the present instance, the limit of safety is passed.

The Bureau of Standards conducts many other investigations which affect the railroads.

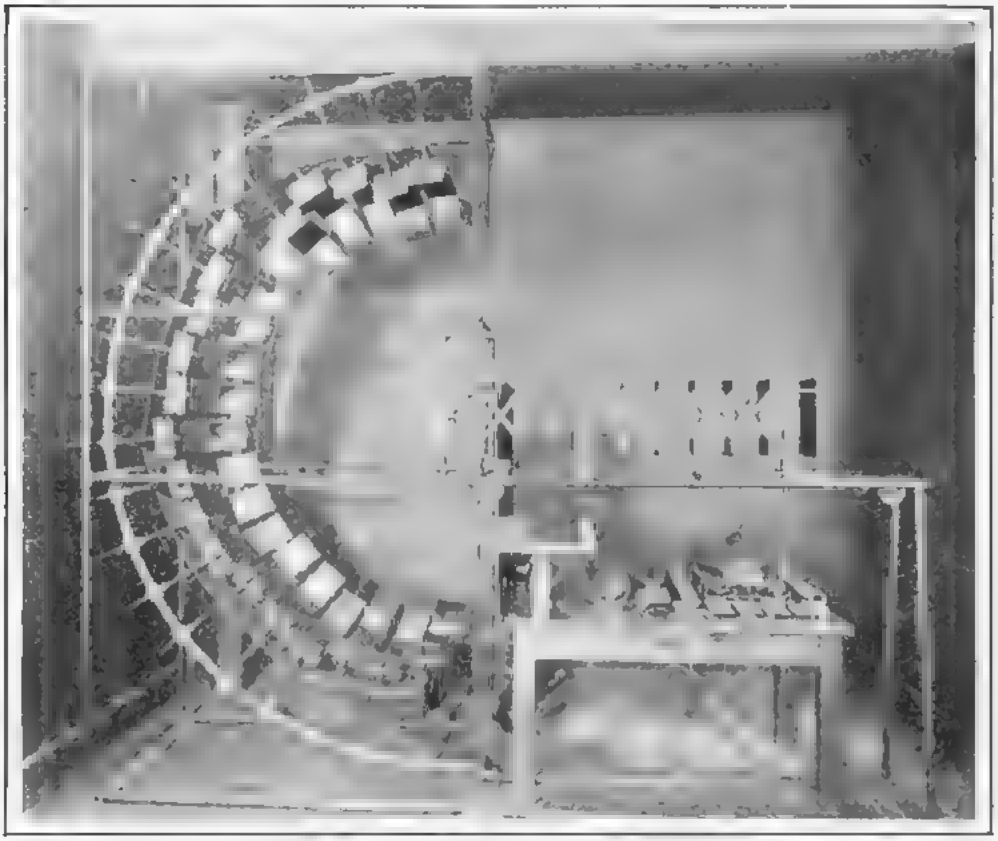
The Railroad Commission of Indiana requires that the electric headlights of locomotives have a candle-power of 1,500. The requirements neglect to state what is meant by 1,500 candle-power. An electric arc may develop much more than that in itself and throw much less than that upon the road-bed. It may send out a total of much more than 1,500 candle-power and yet the effective beam upon the track may be much less.

Some exhaustive tests were undertaken for several railways, and paid for by them, as to the relative candle-power of various types of headlights, oil, acetylene and electric, and the variations in effective candle-power throughout various parts of the beam of light. These comparisons were conducted at the bureau in the photometric division, which concerns itself with the testing of lights.

The results are highly technical, and being privately paid for by the railroads have not been issued in pamphlet form. Nevertheless, they brought forth many facts of interest to railroads in general; among others, that the electric headlight, while undeniably the brightest, is not necessarily the most desirable, since mere brightness is not all that is demanded in a headlight.

The need of an oil law for headlights was also demonstrated, since in the oil headlight the greatest variation was found in the light sent forth by different classes of oil used in the same burner. It was also found at the bureau that simple oil quality tests would establish the grade of oil necessary for a certain amount of light, and that the practise of some railways in saving a few cents a gallon on lantern oil resulted in their getting much less than they paid for, since the lighting quality diminished faster than the price.

At the present time the bureau is carefully testing many electric lights for candle-power and current, comparing them by a standard photometer with a standard electric light, which is a copy of one of the original standards for electric lights in the vault in the bureau. These lights, when tested, are to be used in certain tests of car-lighting conducted by the Postoffice Department for mail car lighting as well as by certain railways



THE ELABORATE MECHANISM USED TO MEASURE THE POWER OF ELECTRIC BULBS USED FOR LIGHTING GOVERNMENT BUILDINGS AND RAILWAY MAIL-CARS

for passenger-car lighting, in order to determine the most effective disposition of the lights in the car and the number and placing of these lights to get the greatest amount of illumination where most wanted

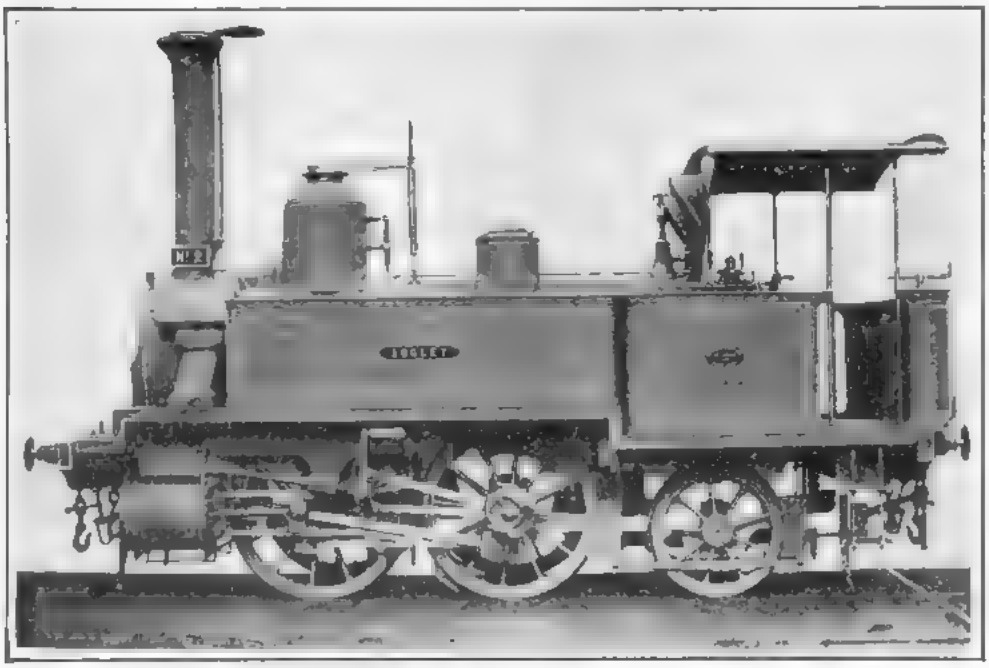
The Pennsylvania Railroad is much interested in the question of car springs As every railroad man knows, car springs either outlast the rest of the equipment or break without apparent cause. The reasons for their sometimes lasting well and sometimes giving out within a short time after installation are not at all understood

It is thought that the explanation may lie along lines of magnetic and electric phenomena, and to follow this idea, the Pennsylvania Railroad now has an expert working at the bureau in conjunction with a bureau expert in making magnetic and other tests of car-springs, to see if some working-basis cannot be formulated which will in some way answer the vital questions regarding the strength and lasting quality of car-springs

Again, the bureau is investigating the disintegration of concrete in railway tunnels, a phenomenon which is not at all understood, as well as the electrolysis of reinforced concrete. It is well known that the seepage of earth currents, especially near cities where such currents are great in extent and quantity has a very pernicious effect on the steel members of concrete buildings, bridges, culverts, etc. The bureau is also working to determine not only the cause of such disintegration, but its best method of prevention

This little known bureau of the Department of Commerce and Labor, with its magnificent equipment and laboratories just outside of Washington, is rendering yeoman service to transportation in general and the railways of this country in particular.

The railway man who visits Washington and who neglects the opportunity to visit the bureau and to see for himself what is being done in its laboratories, is denying himself both knowledge and pleasure. The bureau, as a whole, and Director S. W. Stratton are glad to have the interested public see the work being done and the visitor is cordially welcomed



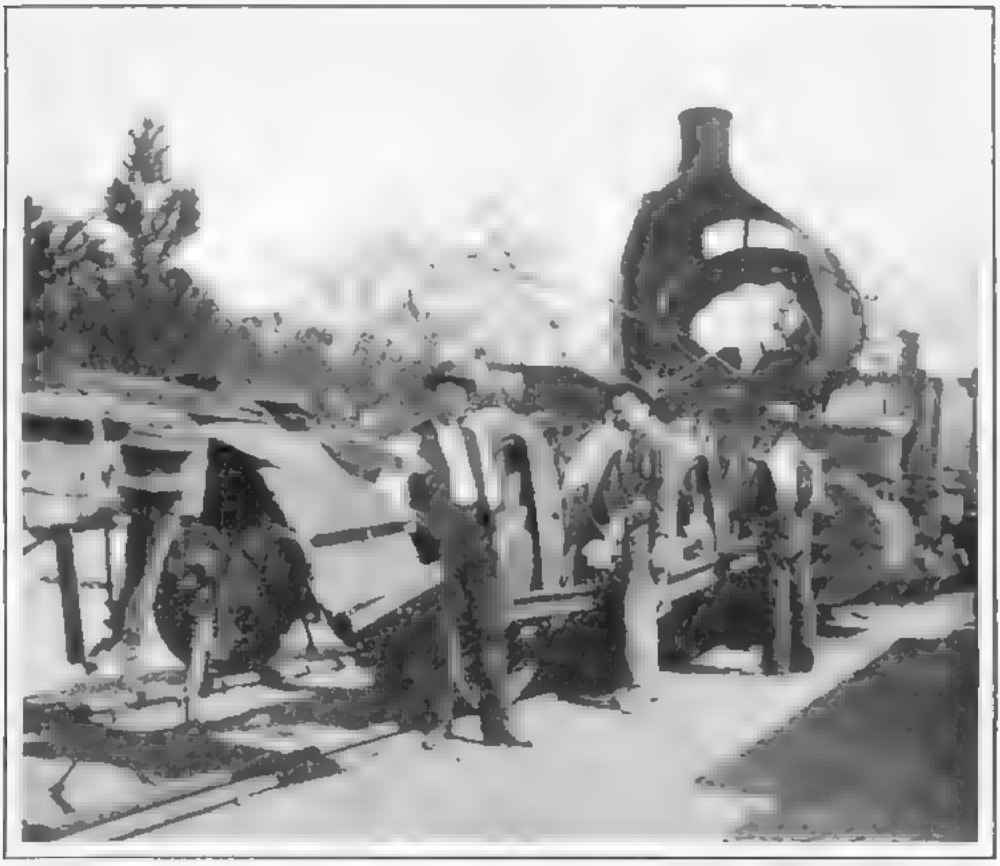
FIRST COMPOUND LOCOMOTIVE CONSTRUCTED BY ANATOLE MALLET, THE FRENCH INVENTOR WHOSE PRINCIPLE IS NOW IN GENERAL USE IN THIS COUNTRY. IT WAS BUILT IN 1877 AND IS STILL RUNNING.

THE WOOLWORTH BUILDING, BROADWAY AND PARK PLACE, NEW YORK CITY.

Photograph copyrighted by Littig & Co., New York

WONDERS OF THE TALLEST BUILDING IN THE WORLD.

Height (from sidewalk) . 730 feet
Number of stories.. 55
Number of floors underground 2
Depth of foundations (caissons) .....120 feet
Height of tower.....365 feet
Estimated weight of building ..... 360,000,000 pounds
Weight of steel work .....48,000,000 pounds
Total area of room space..27 acres
Total area of marble in corridors ....150,000 square feet
Number of windows 3,000
Glass in windows 84,000 square feet
Number of doors.....3,000
Lights, 13,500 outlets or 8,000 lamps
Candle-power of lights.....256,000
Electric wire.....87 miles
Power, 6 boilers, total 2,500 horse-power
Bricks used in construction 17,000,000
Plumber's piping .....42 miles
Number of elevators.....28
Distance traveled by elevators .. . 9,800 feet
Number of persons building will accommodate 10,000
Men employed in construction ..... 1,200 daily
Size of site—152 feet on Broadway, 198 feet on Park Place, and 197 feet 6½ inches on Barclay Street.
Size of tower....84 feet by 86 feet
Style of architecture .Gothic
Cost of building $8,000,000
Construction begun, December, 1910
Completed.....January 1, 1913
Top of steel-work reached .....July 1, 1912
Architect..Cass Gilbert, New York
Men employed on plans.... 5
Men supervising construction 22
Height over Singer Building ..... 138 feet
Height over Metropolitan Tower ..... 50 feet
Will resist a wind of 200 miles an hour



THOUGH THE BOILER EXPLODED, THIS ENGINE STUCK TO THE TRACK WHILE PULLING A HEAVY HAUL OVER THE TEHACHAPI GRADE IN CALIFORNIA.

KEPT TO RAILS THOUGH BOILER BURST.

Upper Structure of the Engine Destroyed, but Drivers Remain on Rails When Explosion Occurred on the Tehachapi Grade.

ONE of the biggest problems of railroading in the West is the stupendous grades which trains must climb. It is no uncommon thing to see a haul of seven or eight cars being pulled and pushed up a long incline by four or five big locomotives, two or three at the head and one or two at the rear.

Where it is possible, it is almost safer and more economical to have one engine do the work of transporting freight and passengers.

The accompanying illustration shows a rather disastrous example of sending a heavy train over the Tehachapi Mountains in California. There were three locomotives on the train.

As it neared the summit the boiler of the last of the three exploded. The entire upper structure was torn apart and scattered for hundreds of feet, causing the instant death of the engineer and fireman.

Strangely, and providentially preventing what might have been a much more serious disaster, the wheels remained on the rails, and the coupling remained intact.

An accident almost as unusual occurred only a few months ago between two steel

electric engines on a road in the East. Though the head ends were badly battered by the collision, not a wheel left the track, and the crews escaped without injury.

This, of course, is not so extraordinary as the instance of the boiler explosion. A boiler explosion usually not only has a very destructive effect on the engine on which it occurs, but also on surrounding property.

The big factors in the motive power of the West to-day—in the fight to climb the mountainous grades of those regions of such wonderful natural magnificence—are the big Pacific types and the Mallets.

For heavy hauling and grade climbing, the Mallet locomotives, though not of exceptional speed, possess almost incomprehensible strength.

THE SUNNY SIDE OF THE TRACK.

A HUMAN TRIANGLE.

FATHER, mother, and son were whirling along on a fast passenger-train in southern California.

"You were born in this State, weren't you?" inquired Tommy of his father.

"Yes, my son."

"And you, mother," the boy continued, "you were born in Georgia?"

The mother nodded.

"And I," Tommy went on, "was born in Chicago?"

"Yes, dear," said the mother.

The boy seemed to be perplexed.

"Tell me, mother," he said after a moment of meditation, "how did we all three get together?"

GETTING CASEY'S GOAT.

CASEY, one of the yard switchmen, had his picture taken astride a donkey. The result did not entirely satisfy him, so he showed the photograph to Flynn.

"Is it good of me?" asked Casey.

"Sure 'tis good of ye," answered Flynn, "but who in thunder is the man sittin' on your back?"

NOT SO STINGY.

PAT, the section-hand, was denouncing a friend who was notoriously stingy.

"Why, Pat," remonstrated Mike, "only a week ago you tould me he gave ye a suit of clothes."

"'Twas a part, I said," contradicted Pat.

"Well," said Mike "thin he's not so bad as ye say, is he?"

"I suppose he's not, but it was the sleeves of the vist that he gave me," retorted Pat.

THE "COURTEOUS" PASSENGER.

CONDUCTOR (examining passenger's ticket)—"This won't do, sir. You'll have to get out and—"

PASSENGER—"I shall not get out. I refuse to be bullied by you. Here is my card. You have your remedy, etc., etc."

CONDUCTOR—"I only wanted to say, sir—"

PASSENGER—"Don't talk to me. You're only a servant. Call the station-master."

CONDUCTOR—"It's all right, sir."

The train proceeds and the passenger relates his tales of various triumphs over railway officials.

Finally:—A dark and lonely platform. One melancholy figure brooding.

PASSENGER (thoughtfully)—"I wonder if that conductor only meant to tell me I was in the wrong train?"

STILL IN FASHION.

JONES wondered why Smith was so indifferent to the beauties of the scenery that swept by the window of the flier.

"What's worrying you, old man?" he finally asked.

Jones meditated.

"I'm on my way to a wedding," he explained at length, "and I've been wondering if it still kisstomary for the best man to cuss the bride."

TWENTY ANYHOW.

"WAITER," said a traveler in the dining-room of an Irish railway, "did you say I had twenty minutes to wait, or that it was twenty minutes to eight?"

"Nayther. Oi said ye had twinty minutes to ate, an' that's all ye did have. Yer train's just gone."

POETRY OF THE RAIL.

FINNEGAN, whose train was "off agin, on agin," has a rival in Donohue, B. and O. S. W. freight-conductor, whose train suffered a breakdown near Hamden. Donohue sent the following message to Train-Despatcher Straight, at Chillicothe:

"Two-twenty-two has a busted flue. What will I do? DONOHUE."

This wakened the slumbering muse in the telegraph-office, and the reply ran:

"Wait. Two-twenty-eight will take your freight. I M STRAIGHT.

And still there are people who think life on the steel rails is all hard prose.

WHEN CUPID MIXED THE MORSE.

BY LYDIA M. DUNHAM O'NEIL.

Written for the "Railroad Man's Magazine."

IN a telegraph-shack, by the side of the track,
Sat a girl at the telegraph-key;
In her dreamy blue eyes, as she pounded away,
Shone a light that was charming to see.
For she loved and was loved; but refused to wed,
For she was in love with her job, she said,
And her job was dearer to her than Ted,
Hoghead on Seventy-three

O'er the telegraph wires a train-order flew,
And this was the way that it ran:
"Engine Seventy-two will meet train Forty-two,
Engine Seventy-six, at Tin Can.
Engine Seventy-eight thirty minutes will wait
For train Twelve, engine Eighty, at Paradise Gate;
Engine Sixty, train Twenty, run one hour late
From Ashley to East Rataplan."

And the dizzy despatcher grasped hard at his chair;
For his overwrought brain he had fears,
When his orders came back from the telegraph-shack,
And fell on his listening ears.
Cupid perched on her shoulder, the mischief! and this
Was the message ticked off by the lovelorn young miss,
And signed, be assured, with a make-believe kiss
For the bravest of engineers:

"Engine Seventy-two, tell me, Ted, are you true?
There's a parson down there at Tin Pan;
Will meet train—never mind what I said, for I find
Life is lonely at East Ash-a-Can.
Engine Seventy-eight, please decide on the date,
And perhaps 'twould be better not too long to wait,
And look out for the freight up at Paradise Gate,
With love from your own little Nan."

Of course she was fired, for girls are not hired
To muddle train-orders like that;
Having lost her position, she sweetly said "Yes";
Ted scarcely knew where he was at.
But the bride never tells of her fatal mistake,
Of her errors in Morse, when her heart made a break,
And her thoughts strayed away, for an engineer's sake,
From the telegraph-shack where she sat.

FROM HORSE-CAR TO DOUBLE-DECKER.

Latest Design for Carrying New York's Growing Crowds Has Twice the Capacity of an Ordinary Street-Car.

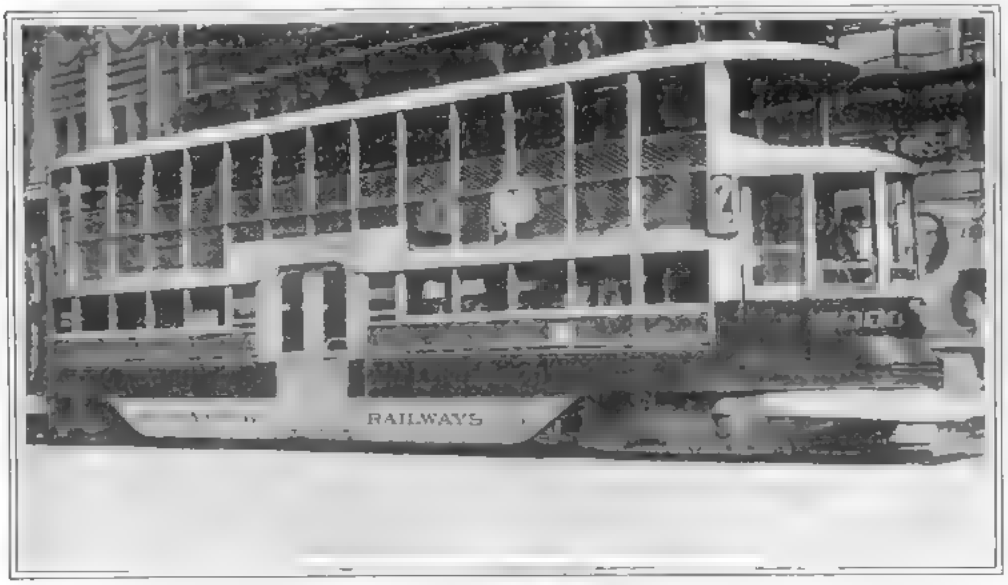
ONE of the biggest problems that confronts New York is the comfortable transportation of its citizens. The city grows with such speed that traveling facilities are soon outdistanced. Men interested in street railways and subways are constantly vexed by traffic, lest it become unmanageable

New York's new double deck street-car is an innovation made with the hope that it will mean more convenience for the public and less inconvenience for the street railways The appearance of the car suggests lightness, speed, and comfort. The street step is only ten inches above the pavement. To reach the upper deck, one has only to climb twenty-two inches more than when boarding an ordinary street car The steps that lead from the lower to the upper sections are broad and small, so that the stoutest old lady and the most hobbled young one have no difficulty in mounting to the top

The car is but seventeen inches higher than the ordinary street-car, owing to the low street step. The seats on the lower deck are placed crosswise, while those on the upper deck extend lengthwise The upper deck is enclosed in wire netting, which in winter will be replaced by solid doors and panels. This type of car, while common in Europe, is entirely new in America

It seats 88 passengers, and 82 more can find standing room without jostling each other. The total capacity during rush hours, therefore, is 170, which number compares favorably with the accommodation of present single-deck cars Of the latter types already in use, the stepless car, recently introduced, and the forerunner of the double-decker, seats 51 passengers; the long, open car, 60, the short open, 50; the long closed, 56; the short closed, 28, and the pay as-you-enter, from 41 to 47

That the time has arrived when the transportation facilities of New York must be increased to afford accommodations to passengers, is not only recognized by the New York Railways Company, but by all, who for business or other reasons, have given attention to the subject. The outside public scarcely recognizes the seriousness of the present situation. Some facts



THE NEWEST STREET-CAR. IT IS A DOUBLE DECKER DESIGNED TO CARRY 170 PASSENGERS.

Photograph by [illegible] New York

THE OLDEST STREET-CAR ONE OF THE FIRST CAR LINES TO BE STARTED IN NEW YORK CITY WAS THE CENTRAL PARK NORTH, AND EAST RIVER RAILROAD COMPANY IT IS STILL IN OPERATION NEW YORK IS THE ONLY BIG AMERICAN CITY WHERE HORSE-CARS STILL RUN.

Photograph by Brown Brothers New York

will assist in emphasizing the need of a radical revolution in local transportation

During the past fifty years the population of what is now the City of New York, has increased a little more than 400 per cent, yet the number of those who make a practise of traveling by public vehicles trolleys, electric railroads, and steam railroads within the city's limits, has multiplied 3,000 per cent. And what is more, the number of those transported annually and locally, is increasing steadily

Last year approximately a billion passengers were carried by all the steam railroads of the United States, these including suburbanites and commuters. In Great Britain the steam railroads carried 1,133,000,000 persons, a goodly percentage of whom were suburbanites. But the rapid transit lines in New York City in 1911 were patronized by no less than 1,550,000,000 passengers!

This means that last year the number of fares for public conveyance in the metropolis were in equal in number to one from every human being on the face of the earth If we may safely base the rate of progression on the data to hand, in sixteen years or so, the rides annually will be equal to twice the sum of the inhabitants of the earth

Travel is increasing much more rapidly in New York than on the railways of this country and Great Britain. The result will be that in, say, ten years, the travelers within the limits of this town will equal the total number carried by the steam railroads of the two nations

Last year elevated and subway cars of New York carried a total of 750,000,000 passengers, which means that the cars are now affording accommodation to about 50 per cent of the total traffic The balance was accommodated by the trolley lines. It has been estimated that the new subways, and the third tracking of the elevated lines will more than double the transportation capacity

More projected lines will, of course, afford added accommodation, but these roads have to do more with the suburban population than have the trolleys, which minister to the needs of an enormous residential population. It is they who will chiefly benefit through the double-deck trolley cars which Mr. Hedley, president of the New York Railways Company, has under consideration

Only a Ninnymoosh.

BY GEORGE VAN SCHAICK.

Even a Dog Understands That it Is Hard to Give Up an Old Friend for a New One.

JACKIE was a dog, and, just then, a miserable dog with no resignation in his character. He had done ten miles that day, at the end of a rope, along the ties of the C. P. R., having been dragged until he had realized that resistance was useless and that the rope was beginning to choke him.

Now he was locked up in an old barn, with the rope still restraining him. He had eaten the food given him, because a dog little removed from savage ancestors knows enough to feed whenever he has the chance.

After this, at the beginning of darkness, he quietly began to chew the rope. Had he known enough always to chew in the same place the job would have been short. As it was he fraved and tore all over a good foot of it, and his gums were bloody before he finished.

Then he investigated the barn, sniffed the rear hoofs of an old horse who paid no attention, and nosed along the plank walls. In one place there was a little sunken spot in the beaten earth, chiefly used by rats interested in the feed-box. There he began to dig.

The ground was very hard, but he persisted though his nails wore down to the quick and his pads got very sore. Time after time he stuck his nose in the hole he was making, sniffed, blew the damp earth out of his nostrils and began again.

After two hours of this he contrived to push his head and shoulders through, but the lower edge of the boards caught him across the back and held him. Finally, with the loss of much hair and some hide, he was free and slunk away, carefully, suspiciously, past some houses and the little saw-mill. Then he climbed on the embankment of the railway and loped away in the darkness like a big brown wolf and with a wolf's easy gait.

The ten miles back took him just a little over an hour. Once he was blinded by a tremendous light, accompanied with an awful roar. The great engine was nearly upon him before he jumped aside and rolled into a ditch filled with cold, black ooze. After the train, with its lowing cattle and squealing hogs, had gone by, he ran onto the track again.

Before reaching the little railway station he leaped over a rough stone wall and took a short cut to a little house.

Here he scratched and whined at the door, but met no response. Then he circled it several times, but everything was tightly closed.

For a time he was baffled and scratched his neck where the rope ring still irked him. After this he ran through the little village, to the small church on the side-hill. In the adjoining grave-yard he found a long mound of newly up turned earth, and, with nose to the ground, sought to untangle a maze of faint scents

Soon he returned to the little house and went down to the river's edge a few yards away. He nosed about the place where the canoe usually stood, turned bottom up, and then lay down for an instant, licking his sore feet. Getting up again he shook himself and started along the stream toward the north where there were no more houses and cold and hunger ever threaten.

Some miles away, near the rapids he came to a portage where his nose went down to the trail of muddy moccasins, sunken deep as if made by a man bearing heavy burdens.

This scent lasted for some forty rods. On a bit of sand beach were other tracks, down to the smooth water, and here the scent was lost again. Once more he loped along the shore, through thickets and tangles, over dead trees, through oozy swamps, but always keeping near the river.

The stars were shining brightly, and tiny puffs of vapor issued from his nostrils, for the frost was coming. At times his feet broke through films of ice newly forming in hollow places among the alders

Hours later when the stars began to wane and a faint red glow was tinting the sky, a man rose from the ground, pushing away his blanket after a sleepless, tossing night. He was broad-shouldered and sturdy-limbed, slow but efficient of motion and as much at home in the great woods as the spruces and the hemlocks.

His face was haggard and worn, dulled with suffering, grooved with the lines of huge pain and sorrow. He took down the little sheet of canvas which, with two corners tied to saplings, slanted to the earth, had made his dwelling for the night. Then he tore bark from the birch trees, assembled dry twigs and unburnt bits from the evening fire, which he placed between two large stones, and hunted about an old dead jack-pine for more dry wood.

In the north the silence is great just before the hours of awakening. Night prowlers have sought their dens and things of the day have not begun to stir.

Yet with uplifted ax, Pete Strong suddenly stood still and listened. Something was moving through the thickets, coming toward him, faster than wandering moose or white-tail, more slowly than hunting wolf.

A few remaining leaves of the aspens began to shiver. Very far away, high up in the sky, there was a honking of geese. In the water, nearby, there was a splash of muskrats. Then all was still again, all but that moving through the brush in the shadows of thick growth.

In an instant a big brown animal threw himself on the man, whining, panting, licking his face—and the paws resting on Pete's breast stained his shirt with blood stained mud.

"For God's sake, Jackie!" cried the trapper, kneeling down as the dog sank exhausted but still feebly wagging his bushy tail

Before this, during the terrible days, Pete Strong had remained dry-eyed. But now, with his rough, unshaven face against the dog's soft fur, big tears came. There were only a few, yet they seemed to bring some peace to his soul.

Then he rose and pulled out his knife. With birch-bark he made a small cup and, seeking fir trees, collected big, clear drops of balsam from the blisters on the bark. With this he smeared Jackie's bleeding pads and tied them up with rags torn from an old shirt.

"Seventy miles you've been to-day," he said. "Yes, all of that. Jackie, you just couldn't keep away!"

He prepared food for himself and the dog. The first feeling of joy was passing away, Pete was again profoundly troubled

"I ought to take you back," he said, slowly rubbing his cold red hands.

He cast his eye over the shore of the little river. It was a bit of dead water

and a strong film of ice covered it, starred and streaked with the clear wrinkles of young ice in the making.

"I can't do it, Jackie," he continued. "You're making a thief of me. If I don't go on now this river will freeze up hard before I can get into the Big Moose, and the winter's trapping'll be done for. There's chances against me even now."

With feverish haste he went to work. In a few minutes he had eaten, and Jackie wolfed down his portion. Pete pushed the canoe down on the crackling ice which gave way. Then he packed it, placed Jackie down in the bottom, and started.

Over the portages, that day, Jackie limped and then lay down at the far ends while Pete traveled back and forth, carrying the winter's stock of pork and flour and the new traps and the canoe with the rest of the duffle.

In three days they made the Moose, over the height of land. In many places Pete had been compelled to stand in the bow and crush the ice with blows of his setting pole. The nights were fast getting colder and the mornings were white with frost. One day as they were drifting toward James Bay, there came a great feathery fall of snow, but Pete just managed to make his trapping grounds, two days' travel up a little river that fell in the Big Moose.

The winter's work began.

In other years, at Christmas time, Pete Strong would bundle up the best of his pelts and some grub and with Jackie and a light toboggan would make his way along the frozen streams and across short cuts in valleys in the bitter, biting cold, camping wherever night overtook them.

Finally he would again come in sight of the little house he had built on a bit of cleared land, and Jackie, however weary he might be, would race along, generally upsetting the toboggan in the deep snow; and the woman would come out, her eyes shining with the light of great joy.

Then Pete would cast down his pack and kiss the woman and loosen his snowshoes. Sometimes, at White River, not far away, the temperature would fall below fifty. The frozen lakes, the earth and rocks, the trunks of great trees, would snap and crack like guns, but within the little house the stove was roaring and the whole world was encompassed by the happiness and love in the dear heart of the trapper's wife.

These few days were all too short, and in a week Pete would return to the wilderness bearing more grub in place of the pelts. Then, slowly, the weeks would wear along till the ice broke and the snows melted. The canoe was loaded deep and the man and dog would again seek home and the woman.

But now there was no question of a midwinter home coming. Pete would shiver at the mere idea of seeing the little house again, whence, helped by friends, he had borne up the little hill to the tiny church the load that had crushed his heart, where a man had spoken of resurrection and he had heard the thud of earth falling on a coffin.

When the memory of these things crowded upon him he would take his square jaw in his rough hands and stare at the little fire in his shack. Jackie would put his head on the man's knees and they would mourn together until sleep would come and blot things out.

The matter of his debts worried him also. There had been two months without work, while he watched day and night at the bedside. The doctor had to be paid for coming twenty miles down the line. Drugs were also costly. Then the previous winter's trappings had been poor, with low prices, and the burning of the saw-mill had thrown three score men out of work.

Pete still owed money to the doctor. The grub he had brought along, and the new traps, had been advanced to him at the Hudson Bay Company's store. He had paid the undertaker forty dollars, and thirty of those dollars had come from the sale of Jackie.

Gregory, who kept the boarding house at Rat River, had often sought to buy the dog. After the funeral Pete Strong had consented, because the idea that his wife's funeral could not be paid for at once simply choked him.

Therefore, he had tied the rope around Jackie's neck and given him to the man. He returned to the house, packed up in a frenzy of haste to overcome the longing he had to end everything at once, which he feared because it would have been shirking his debts.

Galligan, the Hudson Bay agent, knowing his word was good, advanced him all he wanted. A few hours later, having lost Lily, the wife, and Jackie, the dog they had both loved, he was paddling away into the North, determined to fight on, yet hopeful that something might happen to blot him out from living men.

When Jackie had come he realized that he would have to give him back. Yet, it was possible that Gregory might sell him.

When Christmas came an awful anguish kept his soul in travail, but he toiled through the fierce cold with an energy that was superhuman and which kept him so utterly weary and exhausted that sleep, somehow, would come. And Jackie was there, with big deep eyes always reflecting great love.

To his shack, on the first day of February, came Little Canoe, an Indian belonging to his own village, who trapped forty miles farther up the same stream. He was exhausted and had two toes frozen. While Pete attended to them and fed him, there came a tale of a sick wife and provisions low and hungry children.

Pete had killed a young bull moose, and loaded the toboggan with meat and flour, leaving himself very short of the latter. They started away, both men and Jackie pulling the load over snow and hummocks.

With a tenderness learnt in a terrible school he nursed the Indian woman for a week, making poultices with the flour to soothe the inflamed lungs and giving her a broth of moose meat.

One day she seemed about to die and both men watched despairingly until, very suddenly, the hurried breathing became slower and the eyes seemed to close in sleep, for the crisis had come.

Two days later the big strong woman was much better, and Pete left for his shack. In one of his traps he found a fine cross-fox, worth much money when caught, but it had been torn to pieces by some wild thing. Twice over it would have redeemed the price of Jackie.

For a second there was a bitter smile on the man's lips, and he hurried along his fifty-mile line, clearing off snow from the traps, baiting over again, picking up a few pelts, setting snares for rabbits, toiling to cut wood wherewith to fight the crazy, crushing cold of the fierce nights.

Later on, when the bears came out of their holes, he caught several. Jackie saved his life when an infuriated beast, still trap-held, but having pulled the drag-log for a distance, leaped out upon him from behind a rock on the trail.

The tremendous swipe of the great paw carried two of the claws through some of Pete's shoulder muscles, as he dodged back, but Jackie, attacking the bear from behind, made him turn, and with one hand Pete lifted his rifle and the animal fell, shot through the brain.

The wound took some time to heal, but it did not quite disable Pete, who, after a fashion, was able to keep at work. It was well by the time that shelldrakes and black duck and dippers began to arrive from the South and sought nesting places among the reeds of the ponds.

Then Pete and Jackie departed, but without joy. The hunt had been but an average one. The doctor could be paid, also the advance at the post and some other debts. He would find work at some saw-mill during the summer, and would begin the next season free. But he felt very uneasy about Gregory.

Birds were returning; snowshoe rabbits had lost their white color; kingfishers flew along the streams, squealing, and dropping noisily in the water, rising swiftly with their prey

Ten days later, when he landed near the little house, Jackie, as formerly, ran up barking and scratched at the padlocked door, whining.

Pete sat down on his bale of pelts while the iron entered his soul. He did not go in. Shouldering the heavy pack he walked to the store and threw it down, asking for some tobacco, for his had given out for several weeks.

Galligan was a good man. With Pete there was no long bargaining. Fur prices were very fair that year, mink and sable being especially high. The price was soon settled. Then Pete went back to the little house, opened the padlock with trembling hands, and Jackie unavailingly searched the rooms.

That night Pete wrote to Gregory who came down next day on the afternoon train.

"I'm here for that dog," he said.

"Oh, that's all right. It was my own fault. I ought to have put a chain on him. I got a good one this time."

"But," faltered Pete, "I told you in that letter that I'd like to buy Jackie back. I got forty dollars I can spare right now, and I can give you a bit more in a few weeks, after I get work."

"I want that dog," answered Gregory, sharply. "He's mine anyway, and my wife's took a big fancy to him. I want him to breed from. He's the best toboggan dog in this country. I got to take him along, Pete."

They were standing near the water. Little Canoe, the Indian, had just arrived.

While his wife, quite well again, and the children were carrying up his packs to the store, he smoked his pipe, quietly and listened to the conversation

He noted, stolidly, the bitterness of Pete's face, and the look of determination on Gregory's, who had already fastened the steel chain and the collar about Jackie's neck. Then the Indian dug in a pocket of his overalls and brought out a little bundle done up in thin birch bark and tied up with *babiche*.

Carefully he unfastened it and picked out a pearl.

"What you think?" he asked Gregory.

It was as large as a big pea, very round and of Oriental luster. The man looked at it greedily

"Well, I'll give you fifty for it," he finally said.

"Uh! Others give lot more," grunted the Indian.

Gregory knew that it was worth fully a couple of hundred or more.

"What'll you take?" he asked.

"Me want buy that dog. Me give um pearl for the ninnymoosh."

"Sure, Mike!" exclaimed Gregory. "It's a bargain. There's your mutt. You can have the chain, too, for you'll need it."

He grasped the pearl and hurried away, for the up train was soon due.

Pete Strong was looking at Little Canoe, wonderingly.

"Him Gregory no good," opined the Indian. "Just big kukush, big hog. Me find um pearl in Little Mink River. Me owe you for my woman—mighty good woman an' work like a horse. Me swap dog for my debt. Here your ninnymoosh. So long!"

He turned away after handing Pete the chain, going slowly to the store where his able mate and the children had carried his pelts. While Pete sat on a log and, for the second time in his adult life, felt the coming of tears, Little Canoe, who had paid like a prince for a dog, began with Galligan a whole week's bargaining and haggling which was the utmost joy known to his soul.

Then Pete took off the steel chain and the collar and swung them far out into the river. With Jackie he turned to the little house again, and found that greater peace now abided in it.

BUILDING ROAD THROUGH ANT HILLS.

ANT hills are furnishing a considerable portion of the work for contractors on the present extension of the Cape-to-Cairo road in Africa, which is now proceeding from Elizabethville in the Congo to Bunikeia. This stretch of several hundred miles is over a plain varied only by the enormous ant hills which in some instances rise 60 feet high.

Observatories intended primarily for surveying purposes have been built by the contractors on these ant hills, says *Popular Mechanics*. The preparation of the roadbed through this section requires only the cleaning out of the jungle along the right-of-way, and the destruction of the ant hills which are encountered, but as all the earthwork is done by hand labor, much time is spent tearing down the ant hills. The ants are white, and well under an inch in length. They are very destructive, ruining almost anything they encounter except metal, and frequently they travel in armies which do great damage.

Mistakes mean backing up, repeating the run and losing time.

Drift, of the White Crow.

BY JARED L. FULLER.

Author of "Block Tower Seven," "The Phantom Train," "The Jumping-Off Place," "The Flight of the Bald Eagle," Etc.

Though the Headlight of Suspicion Is Dim, It Points a Few Feeble Rays Toward the Flier's Engineer.

SYNOPSIS OF PREVIOUS CHAPTERS.

TOM DRIFT, engineer of the White Crow, the star train of the N. and P., is suddenly discharged by James Serrill, superintendent of the Big Boulder division, after saving an excursion train from a wreck in the yard. Shortly afterward Serrill is mysteriously murdered in the shops. Ballington Serrill, his nephew, who succeeds him, reinstates Drift. Captain Stranahan, chief of police, is put on the case, and suspicion points strongly to Drift or his fireman, Budd Phelps. On the same night, the White Crow, with Drift at the throttle, runs into a tidal-wave.

CHAPTER VI.

Anxiety.

YOUNG Ballington Serrill had spent a very bad night following the mysterious death of his uncle. A messenger brought to his bedside in the morning instructions from headquarters confirming his snap appointment to the situation left vacant by the demise of James E.

The directors and head officials of the Northwestern and Pacific knew the young man's mettle. Ballington had showed marked executive ability, and there are other traits of character beside a knowledge of keeping repair charges down, which commend themselves to railroad directors. Perhaps it was just as well for the Big Boulder division that there was a change in its chief executive.

The daily problems of the office did not make the young superintendent anxious, but he arose to face the complications arising from his uncle's death with a dread which he could scarcely explain. He desired to see the murderer punished—if his uncle had been murdered. Yet the suspicions which seemed to becloud Tom Drift well nigh unmanned young Serrill. Yet he had no particular or personal interest in the engineer of the White Crow flier.

Sara Longstreet's mention of little Milly Drift, however, had set a whirlpool of thoughts in motion in Ballington Serrill's mind. He had met the girl but once, and marked the sweetness and gentleness of Milly's character. Since being reminded of her existence, she almost filled his thoughts.

He saw that Captain Stranahan was divided between Drift and his fireman in his opinion as to the murderer. He feared what the police official might do when the White Crow steamed in from Big Boulder on this afternoon. Suppose the die fell against Drift? Budd Phelps seemed to have prepared his alibi; at least he had referred to Gid Larrabee as being with him at about the time the unfortunate super met his death.

Where was Tom Drift at that hour?

Ballington had gained the idea that old Anson Prendergast had found Drift at his home that evening. When and how had the discharged engineer reached home? That idea troubled him. After the first rush of morning business was concluded he called up old Anse from the yard. Feeling that he was playing the part of a spy, yet condemned by his anxiety to this very course, young Serrill tried to probe the old man in a roundabout way.

"Mr. Prendergast," he said, "are the freights being handled as smoothly as possible up the yard? Hasn't there been some delay in getting out the heavy trains—delay which can be avoided?"

"I dunno," drawled the old man, eying him with his head cocked on one side.

"I—ahem! hear such reports," stammered Serrill.

"And it's likely you will," grunted Anse. "I never did see the time yet when people didn't kick—live people, I mean."

"Yes, yes; but we can't have shippers sending in complaints all the time. There seems to be a good deal of it. Do you think we do our best in moving freight?"

"Wal, Mr. Serrill," drawled the old man, "you can reckon on my standin' up for my own family every time. I never was one o' them fellers that, if his boy gits licked at school, he goes home an' licks him again, so's to show he ain't no bigot.

"No, sir! I'm standin' up for our own road every time. Mebbe what you speak of might be improved a trifle, but I wouldn't 'low that any other division is quicker on freight movin' than us."

"That may be so, but how was it last night? Did the Eastern freight get out on time after the wreck in the yard?"

"Wal about."

"And the Western freight No. 37? How was she?"

"She pulled out at six-thirty—exact."

"Sure of your time?"

"To the second, Mr. Serrill."

Ballington Serrill had reason to know that Tom Drift had been recently riding on that freight to get home. There was no other train up the line that would have taken the engineer to Hallett Crossing at supper time.

Drift had been near the shops where the old super was killed just about the starting time of No. 37. Was there any way of telling just the moment James E. Serrill had been killed?

Ballington waved the old man away. He had little time to study on this last problem, for Captain Stranahan bustled in.

"Look here, Mr. Serrill," said the police officer, confidentially, "I'm getting some things down to a fine point, and don't you forget it. One of those fellows did your uncle up, and that's all there is to it."

"One of which fellows?"

"Either Drift or that Budd Phelps,"

"I thought Phelps had his alibi ready?" said the young superintendent, slowly.

"That's all right. And he told the truth about being in Mehan's saloon. This Gid Larrabee *was* with him. But he says he met the fireman at the door of the boiler-room, and he cannot swear that Mr. Serrill was the man whom he saw standing inside with Budd. The latter *said* it was the super, and Larrabee took it for granted that it was so."

"Ah!" exclaimed Ballington.

"You see? There's a weak spot in Phelps's alibi. And, another thing, Larrabee did not see the whole of the fireroom. I have questioned him. He admits that the spot where your uncle was found lying dead was hidden from him as he stood at the door."

"Yes?"

"Mr. Serrill might have already been dead when Gid appeared there and took Budd Phelps away."

"I see what you are aiming at, captain," said Ballington, nodding.

"Do you?" returned the police officer. "Whom do you think the man with Budd might have been, then?"

"Eh?" asked Ballington, startled.

"The man standing inside when Larrabee glanced in—the man he took to be Serrill. Why," concluded Stranahan, throwing himself back in his chair and speaking with emphasis, "*why not Tom Drift?*"

Why not, indeed? Ballington could not reply, and only stared dumbly at the chief of police.

"Drift and Phelps may be in cahoots," went on Stranahan. "I'll show you what I have found out. Drift was seen

on the street just as the shops were letting out. I can find fifty witnesses to that."

Ballington nodded.

"Did you hear about old Jake Monteith? Yes? Well, Drift was on the spot when my men captured the old fellow. Jake had threatened Mr. Serrill, you know.

"Well, your uncle went on toward the fire-room, and I have found two men who will swear that Tom Drift followed him and turned up the lane toward the railroad yard."

"He was going home," exclaimed Ballington, explosively. "He jumped the west-bound freight. Prendergast found him at home."

"I know all that. I don't say Drift did it. I only put the facts before you," Stranahan said, doggedly. "When does that train leave the yard?"

"It left at six-thirty last night. I got that straight from Prendergast."

"Ah-ha! You've been making some inquiries yourself, have you?" returned the policeman, with a leer. "You can't blame me for having suspicions of your crack engineer, Mr. Serrill, when you have them yourself."

The superintendent grew red and could say nothing. Stranahan proceeded:

"Death was instantaneous in your uncle's case. The doctors cannot tell us the exact moment he was killed. It may have been before, or after, the departure of that freight-train."

"I know it," admitted Ballington

"Of course, Phelps seems to be connected with the murder in either case. To fix any knowledge of the crime on Drift, the time of the act must be known."

"And, as you say," Ballington hastened to observe, "the doctors cannot tell us that."

"No, they cannot fix the time," admitted Stranahan. "*But I can!*"

"What?" cried the amazed super.

"Sure as you live, sir! I can give you the exact moment at which your uncle was struck and killed."

"How will you do it?"

Stranahan leaned forward and tapped the official on the knee. This was evidently a discovery on which he prided himself.

"It's easy," he whispered. "The blow that killed your uncle smashed his watch. The hands point exactly to twenty-five minutes past six."

"Five minutes before No. 37 left the yard!" groaned Serrill.

"Exactly. Plenty of time for a man to run out of the shops, sneak around the back of the roundhouse, cross the tracks, and catch the evening freight. Gid Larrabee can't place the time he met the fireman at the door. This discovery doesn't prove anything, I know, save this: Tom Drift might have been on the spot when your uncle was struck down."

CHAPTER VII.

Through on Time.

IF any of the passengers or members of the train-crew behind No. 101 saw the tidal-wave coming down Mad-Horse Cañon, they must have been terrified indeed when Tom Drift put on full speed ahead. Utter extinction threatened from that body of water; but the eagle-eye and Budd Phelps both knew that they had grasped the only chance for salvation. And that chance looked slim.

The walls of the cañon now echoed to the increasing voice of the torrent. The crest of the oncoming wave reached the trestle crossing the Big Boulder, and Drift and his fireman saw it disappear eaten up by the flood. Whether or not the water had torn away the bridge they could not tell. The bed of the cañon was inundated, and the rails and road bed disappeared with frightful rapidity as the wave rolled on.

The White Crow was snatched along at a speed that must have startled her passengers.

No. 101 showed herself to be a good steamer, despite the fact that she was a veritable hog for fuel. She went shrieking up the cañon about as fast as the White Crow had ever traveled. Her pilot was some rods from the curve, however, when the front of the flood burst into the Cooking Pot.

It overran the banks of the river. The boiling torrent spread quickly from side to side of the circular basin, but as the train shot around the curve at a speed that threatened to derail the cars, Tom Drift saw that the volume of the flood

was not sufficient to sweep the train from the track.

He reversed and gave her the air, which quickly brought the White Crow to a halt. The flood surged around them. It rose into the cab. It roared away down the cañon, becoming a whirlpool at the lower exit of the Cooking Pot. But the train was out of danger, on the curve of the basin. The river subsided rapidly, and the conductor picked his way forward along the ties, which were still inundated

"Ginger, Tom!" he exclaimed, "we come near making glory our terminal that time,-eh?"

Drift was fuming over the delay.

"Like enough," he grumbled, "the trestle up ahead is weakened. We don't know what damage may have been done by that cloudburst over the Saddle."

"Be thankful," said the con. "We were on time to this spot. If the White Crow is late getting down to Logan, it won't cost us anything."

By that time they could see the track ahead, and up the cañon as far as the bridge. Some rubbish had been deposited upon the right-of-way, but nothing that would interfere with the passing of the train.

When he started the locomotive again, however, he dared not to speed her. There might be some place where the rails were weakened by the flood.

At the trestle he brought her to a full stop. Little, the con, went ahead. Halfway across the trestle a track-walker was coming hastily down from the Saddle, inspecting the rails as he progressed.

The White Crow waited until this man crossed the river. He assured Drift that the trestle had not been weakened. The train moved out slowly, but gained speed as they went on. She was late, and the hardest part of the drag was just before her.

Budd Phelps bent to the shovel, and the iron horse strained at her work as though endowed with actual life. Tom Drift coaxed her up the steep ascents and across the narrow plateaus. They reached the summit of the Saddle and roared over the height, taking the straight, steady descent at a speed that increased each moment.

From that point the trip was one that the train-crew, as well as nervous passengers, were not likely to forget. Only the engineer and the conductor, who held his watch on her, knew how fast the White Crow flew.

There were no stops after passing Summitville. At Julep, Drift had regained most of the lost time, and a few minutes later the man at the board in the Logan City terminal wiped off "White Crow Express late," and wrote instead, opposite the name of the Big Boulder's crack train, "On time!"

She came thundering down into the yard, and the eagle-eye of the flier brought the locomotive to a panting halt under the train-shed with greater anxiety of mind than he had ever before experienced at the end of a run.

The report he had to make was nothing. No Tartar, like James E. Serrill, was waiting to call him "on the carpet."

Drift's trouble was caused by the possibilities arising from the mysterious death of the superintendent. What would happen to himself, or to Budd Phelps, now that they were within reach of the Logan City police?

Drift would not have been surprised if Captain Stranahan had been waiting with a warrant for his own arrest. If Budd had been seized the moment he ran the locomotive down to the roundhouse, and carried off to jail, that would not have been beyond Drift's expectations. But nobody spoke to the engineer of the murder. There were no police in sight. He did not even see Ballington Serrill about the terminal.

Going down the yard, after turning in his report, Gid Larrabee, old Anse Prendergast's long-legged assistant, overtook him.

"How's 101, Mr. Drift? Ain't like your old 67, is she?" he asked

"Not much. But we managed to pull her through on time. She's not the mill old 67 is. And my fireman—"

"He's all right, isn't he?" interposed Gid. "Budd's run on a freight hauler. Of course, he's been in the shops lately."

"He seems all right," Drift admitted, slowly. "And I'd be ungrateful to complain of a fellow who is so anxious to do his part. Besides, he saved my life last night here in the yard, I really believe."

"I heard about that crane just missing

you. Budd's got grit in his craw all right! It was me put him up to asking for a tallowpot's job on a good run."

"You're chummy with him, are you?" queried Drift.

"We always go home together. I stop for him at the boiler room nights—I've been doing that, I mean, until he made this change. 'Twas lucky I did last night, eh?"

Drift looked at him curiously, in silence.

"The murder of the Old Man," whispered Gid, with his hand beside his mouth. "Budd might have got into trouble—been suspected, ye know. I'm his alibi," and he chuckled, his freckles glowing.

"You are!" exclaimed Drift.

"Them police are regular old grandmothers," grumbled Gid. "I know they thought Budd killed the Old Man. But I put a spoke in their wheel."

"Indeed?"

"Sure, I was with Gid. I went over to the shops as usual and he come out, leaving the super in the boiler-room. It couldn't have been but a minute or two before he was killed—poor chap!"

"You saw him, did you—alive?" asked Drift.

"Of course he was alive! Standing just inside the door."

"You saw his face then? You identified him?"

"We-ell," Gid drawled it. "That's what old Stranahan asked me. Pshaw! I don't need to walk up and shake hands with a party to identify him, do I? Fact is, I only saw his shadow. But Budd said it was the Old Man."

"Oh!" muttered Drift.

He said nothing more, and the younger fellow went whistling into the foreman's shack.

Tom Drift's mind was hard at work upon another phase of this terrible problem. Gid was not sure of his man, after all. What was a shadow? Granted, that somebody stood within the boiler-room when Budd came out and halted his friend. But James E. Serrill might have been dead at that time. Couldn't it have been some other person whose shadow Gid Larrabee saw inside the already dusky fire-room?

Drift's mind seized upon this idea with tenacity. He remembered keenly the incident which had just preceded the interview of the fireman and Mr. Serrill on the spot where the latter had been found killed. There had been another individual near by. When Drift had passed through the lane and out into the railroad yard, he had left Maria Monteith standing at the door of the building.

This was probably but a few minutes before Gid came along. The murder may have occurred during those few minutes. It must have happened within a very brief space following his own departure from the vicinity—Tom Drift was sure of that.

And Maria Monteith had reason for hating the man who had been killed. He had threatened to strike her there at the fire-room door—would have done so, indeed, had not Budd Phelps stepped between them. The young eagle-eye of the White Crow knew all the details of the unhappy connection of the dead superintendent with Jake Monteith's daughter.

Serrill had enticed her from her humble home on the mountainside when he had first appeared in Logan City. He had deceived her, had deserted her, and she became notorious in the town. But in the end Maria Monteith had made James E. Serrill marry her and that marriage, which Serrill believed at the time to be a mockery, proved to be valid under the laws of the State.

Budd Phelps loved the daughter of the insane engineer—he had always loved her. How easily Maria might have persuaded the fireman to murder the man who had wronged her!

These thoughts seethed in Drift's mind as he pursued his way down the yard to the siding where No. 38 was being made up.

As he came near, the head locomotive of the long freight began to squeal for the switch. Lanterns flashed in the twilight.

Drift quickened his steps. He had intended, as usual, to ride in the doghouse; but the middle of the train was about opposite him, and the wheels began to turn. Drift knew that when the rear locomotive passed him the tail of the train would be moving at a dangerous speed.

There was the open door of a cattle-

car before the engineer. He leaped for this entrance, caught it with his hands and wormed his way in.

As he got to his feet somebody darted from the other side of the car and tried to leap out. Drift caught the man and held him

"Hold on! hold on!" he exclaimed. "Want to break your neck? She's going too fast. If you want to leave, wait 'til she hits the grade."

"Oh!" exclaimed the stranger "You're not one of the shacks, then?"

"Thought one of the boys was after you, eh?" chuckled Drift.

He got a better view of the man, and was surprised to see that he had none of the appearance of a hobo. He continued to peer out of the car-door nervously.

"Don't worry," said Drift, kindly "The shacks won't bother you in this empty car."

"It ain't empty," said the man.

As he spoke there was a sudden clatter of hoofs in one end of the car, answered instantly by a shrill and angry squeal from the other end

"What's this?" exclaimed the engineer.

"A couple of stallions belonging to McGuire, the horseman, over the range. I believe," said the stranger, with the same nervousness. "Imported Percherons, and as ugly as tigers."

"You seem to know all about them?" said Drift.

"I saw them being fed here in the yard an hour ago. I'm told the horses have become wicked from being shut up clear from the East. They would fight to the death if they ever got together."

"Humph! that's interesting," said Drift. "I don't blame you for wanting to change cars. I'd like to myself –but not just now."

The train had not yet struck the steeper grade and her speed was too great to tempt a sane man to jump. Besides, the right-of-way was bordered with a ditch full of boulders.

Drift peered closely at one of the partitions, of which two had been thrown across the car to make boxstalls for the stallions. But he started back with no little fear when the animal behind that seemingly frail partition charged at him.

It was a great, glossy-hided, black brute, with ears laid flat to his head, and eyes that were actually red with rage. The stallion leaped against the fence, and the barrier creaked ominously as the train rattled over the switches and took the main track up the mountainside.

Drift wished himself in some other place as the second stallion answered the challenge with a wicked sounding neigh.

Hallett Crossing was only a run of twenty minutes at the speed No. 37 was making.

CHAPTER VIII.

Tom Drift Makes a Friend.

THE stranger had filled a pipe with tobacco and squatted on the floor beside the open door. As the glow of the match revealed his features more clearly, Tom Drift said:

"You're not a railroad man, I take it?"

"Nix on that, mister," was the reply. "I've tried my hand at many things, but never on the iron."

"I believe I've seen you before," said the engineer.

"I reckon. I know *you*. You run the flier, don't you?"

"Yes."

"Well, I'm saying fare-ye-well to this old town—and glad of it. Lost my job anyway."

"How's that?" asked Drift.

The man did not reply directly, but pursued his train of thought which seemed not particularly pleasant.

"I'm always getting it where the chicken got the ax. One day nussin' loonatics, and the next ridin' in a car with a couple of mad hosses. Look-er that now!"

His voice was drowned by another duet of squeals from the stallions. Exasperated by their long captivity, the brutes seemed determined to get at each other.

Drift himself was really sorry he had got into this stock-car, but he began:

"I don't believe they'll break—"

A deafening crash drowned his statement. One of the stallions had turned in his stall and his iron heels played a tattoo upon the fence. The splintered

wood began to fly. Suddenly a plank was driven completely across the middle space of the car and in its course carried Drift's companion with great force to the floor.

The man lay half stunned.

Pandemonium reigned in the stock car, for the other stallion renewed his endeavors to escape.

Drift, confused by the din, and more than a little terrified, crowded close to the partly open sliding door. The plank had hurled the other man to the far side of the car, where he reclined on his elbow, groaning. The engineer called to him, but he did not realize his peril.

Drift saw that the fence was bound to come down. Another plank flew from it under the black stallion's heels. The other horse was a bright bay, and challenged by the cries and hoof-beats of the black, he reared and flung his full weight against his own barrier. It was already weakened by former charges. Now it sagged outward and Drift saw that it must go.

The injured stranger lay almost in the path between the enraged brutes. If they came together he would be trampled to death. Had it been an emergency connected with the running of his locomotive, Tom Drift would doubtless have been prompt enough to help his companion. He would have known what to do almost mechanically.

Confronted with an unfamiliar problem, he hesitated. And, at the moment, down went the bay stallion's barrier.

The force of the charge brought the brute to his knees, and while it was struggling to regain its feet, Drift leaped across and seized the half-stunned man in his arms.

He could not return to the open door. He had hesitated too long.

The last planks of the black stallion's partition went down. He whirled about, and the two enraged creatures collided in the middle of the car.

Had they reared at that moment, and one of them fallen sideways, it would have been death for both Drift and the other man.

The engineer dragged his burden close against the wall of the car and groped for the edge of the door, trying to slide it aside.

The door was fastened!

Drift pulled the other to his feet, and yelled to him to dodge the maddened brutes if the jolting of the car threw either stallion in their direction. The man scarcely seemed to understand.

With glaring eyes, their satin breasts flecked with the foam which flew from their lips, teeth snapping like steel traps, the two stallions closed in a struggle.

In half a minute each had inflicted a dozen minor wounds upon the other, and the blood, spouting from severed veins, dyed floor, and walls, and ceiling.

Drift attempted to draw his companion back into the end of the car which the black stallion had occupied; but at that moment the bay drove his antagonist that way, and only by a hair's breadth did the two men escape death.

It seemed to half arouse the injured man. With Drift's aid he got behind the partly demolished fence that the bay stallion had knocked down, and they both crouched there, watching the battle.

Drift might have left the other to his fate, and reached the half-open door on the other side of the car in safety. He might even have risked leaping from the train, for they were on the steeper grade now and the engines could not force 37 to a high rate of speed.

His comrade in peril had sunk down, dazed again. The flying plank had struck him a terrific blow on the head.

The two horses, fighting in the middle of the car, made Drift shrink from an attempt to escape through the open door.

He propped the broken fence into a more upright position, hoping that the battle-ground would remain where it was. But the black horse reared and plunged, striking the bay with both forefeet, and the latter went down before the attack, rolling against the fence and smashing it.

Drift dragged the other man back into the rear end of the car. He picked up a plank and a bit of scantling, and attacked the barred window.

Getting a purchase by good fortune, under a corner of the frame, he pried out the bars, frame and all, and flung them behind him.

"Up! Get up, *you!*" he bawled into the other man's ear, shaking him by the shoulder. "Crawl through that window and cling to the bumper outside. These brutes will be the death of us!"

He half lifted the man to the aperture. Head first he went through, his feet paddling the air like a swimmer's in the sea. Drift feared that, in his present state, the stranger from the insane asylum would dive between the stock-car and the next.

The engineer was determined to take this means of egress himself; as he sprang for the window the fighting horses charged down the car, both fell, and the bay rolled over, one of his hoofs coming in contact with Drift's right leg—and with sufficient force to bruise it.

Drift did not fall. The stallion was up in a moment. The deadly duel was continued.

Tom Drift escaped and found the ex-keeper from the insane hospital clinging more dead than alive—to the outside of the car. Drift instantly found the bellcord.

The train was already nearing Hallett's. As she pulled down in answer to Drift's signal, the crew and the traveling stockman ran up, hearing the battling of the stallions. The fight suddenly came to an end.

The bay had fastened his teeth in the jugular of the black horse and choked him to death.

"There's fifteen hundred dollars of Old McGuire's money gone," drawled the man placed in charge of the horses, but who had been riding in the doghouse. "The old man will be ravin'. But sheet-iron partitions wouldn't keep them brutes apart, when they're mad.'

Drift explained to the con what had occurred—and he said a good word for the man from the insane hospital. He was not seriously hurt.

"He wants to get away from Logan City. Lost his job, and all that," explained Drift. "Let him bunk down in the shack till you pull over the Saddle, will you?"

"My Lord! he can go clear to Big Boulder, if he likes, Tom," said the conductor. "What's his name?"

The man answered for himself.

"John Bell," he said. "And I want Mr. Drift to know that if there's ever anything I can do for him—whatever it is—I'll be mighty glad to do it."

He wrung Drift's hand as he slowly mounted the step into the caboose behind the pusher. Drift waited beside the track and saw 37 pull out again and climb the grade.

It was not until later that he knew he had parted company with the man whom (he afterward had reason to believe) carried away from Logan City the secret of the murder of James E. Serrill!

CHAPTER IX.

Milly.

THE storm in the mountains which had flooded the Mad Horse Cañon and almost wrecked the White Crow Flier, was the first day of a period of bad weather. Storm succeeded storm There were washouts and every trestle in the mountains caused apprehension.

Although Tom Drift had brought the flier through on time from Big Boulder on the first day, the next few trips did not add either to his reputation as an eagle-eye, nor to the reputation of the White Crow.

All traffic was delayed. The section hands were overworked. Extra gangs of men were put on all along the Big Boulder Division.

Ballington Serrill had plenty of worry. Chief of all his trouble was that which arose out of the strange and tragic death of his uncle.

The funeral had been a quiet one, attended only by a few railroad people. James E. Serrill had not been liked in Logan City, and the scandal connecting him with the insane engineer's daughter could not fail to win him an unenviable reputation.

The town still buzzed with the mystery of his death. Stranahan seemed to be doing nothing at all—though Ballington Serrill knew that the chief of police was very wide awake. The coroner's jury had brought in one of those verdicts which may mean nothing—or much. "Brought to his death by a blow from an unknown instrument in the hands of a person unknown."

This did not satisfy the general public. Nor was it satisfactory to the newly appointed superintendent of the Big Boulder.

There were some duties connected with his uncle's death that Ballington could not shirk. James E. had died without making a will. He had some prop-

erty, including some thousands of dollars in the bank. Somebody had to settle the dead man's affairs, and with the intention of seeing that justice was done, Ballington applied to the court and was made administrator.

He believed that his uncle's property should go to just one person. He was assured that James E. Serrill—whether under duress, or how—had married the daughter of the insane engineer, Jake Monteith. Ballington investigated the public record of the marriage, and looked up the justice of the peace who had performed the ceremony and one of the witnesses signing the certificate. It was a legal, if inexplicable, marriage.

"Then," decided Ballington, "Maria Monteith is my uncle's widow. She has her rights and I'll see that she gets them."

He found the house where she had been living with her father before he was taken to the insane hospital on the day of Serrill's death

It was closed—the shutters and door fastened. The Monteiths had lived here for a number of years. Next door the Widow Phelps lived with her son.

Ballington asked for old Jake's daughter. Mrs. Phelps seemed to know nothing about the girl indeed, she spoke of her harshly, much to Ballington Serrill's surprise. But later he learned that the old woman greatly disapproved of her son's affection for Maria Monteith.

Believing that either Budd or the mother knew where Maria was to be found, the new superintendent wrote a letter in which he expressed his desire to turn over to Maria the property legally belonging to her, and sent it down to the roundhouse to be delivered to Budd when he finished his run that day.

This was only one phase of Ballington Serrill's activity connected with the tragic death of his uncle. Nor was it this that made him most anxious.

It was the uncertainty of what threatened Tom Drift that bore heaviest on his mind. Stranahan kept away from him. Was the chief of police preparing to spring a mine?

Whispers regarding Drift's connection with the "murder," as the papers insisted upon calling James E. Serrill's death, were still in the air. The suspicion would not down

He shrank from mentioning the matter to the engineer. But how did Milly, the sister, bear up under the cloud that overshadowed her brother's reputation? Ballington Serrill could not drive the pretty little sister from his mind.

He ordered his horse from the livery stable (riding had been the only out-of-door exercise he had had time for since coming to Logan City) and rode off through a "Scotch mist" into the hills—up the wagon-trail to Hallett Crossing.

There was a promise of heavier rain and the wind moaned above him in the pines as he rode along. It was mid-afternoon, but the sky was so thickly clouded that it was already twilight in the mountain path. Occasionally through a break in the overgrowth, the young superintendent gained a view of the railroad bed, which here was lower than the horse path. The right-of-way from Hallett Crossing to the yard at Logan City was under a high bank, and with a steep descent into a ditch on the other side. Standing on this upper bank, in some prominent spot, one could see far, far up the mountain, along the straight rails of the Big Boulder.

There was only an east-bound freight to come down this afternoon before the White Crow was due. Serrill stopped to watch this freight pass, and before urging his horse on again he saw a fluttering object upon a sharp promontory of the embankment, some distance ahead of him.

Occasionally he would catch sight of that fluttering thing through the trees until, after ten minutes' riding, he identified it as a skirt. A girl stood upon the exposed point, her short walking skirt fluttering in the wind, the increasing rain beating down the mountain upon her unsheltered figure.

The little group of cottages, the blacksmith shop, the station, and the church, which made up Hallett Crossing, were close at hand, now; but Serrill saw no other living thing in the rain but this girl.

He watched her curiously. The slight form swayed in the wind and she clung to a sapling for support as she leaned over the abrupt edge of the bank.

She was looking up the right-of-way. With no particular reason for thinking so, Ballington Serrill was struck with

the idea that it was Milly Drift waiting to see her brother's train, as it came over the ridge and shot down toward the terminus of its long run.

Nor was he mistaken. Seldom had he seen the childlike figure of the engineer's sister, but she had made so strong an impression on Serrill's mind that he identified her at that distance

He had turned his horse from the beaten track again and crossed the bed of pine-needles, that deadened the animal's footsteps, toward the girl.

He had perhaps never realized before that the women in railroad families, like those of the fishermen, live continually in dread of that chance which follows as closely on the men of the rail as it does those who go down to the sea in ships.

A feeling of uncertainty—a belief that peril was in the air—distressed Ballington Serrill. Suppose something should happen to that frail young girl, at the brink of the embankment overhanging the rails?

He leaped out of the saddle, for he dared not urge the horse nearer the extremity of the solid ground. He threw the bridle rein over a stub and strode on toward the watching girl.

The soughing of the wind and the beating rain quite drowned his approach. He was within half a dozen yards of her when a mighty blast came pouring down the slope, shaking the trees and bending some almost horizontal. This was no time for Milly Drift to watch for the coming of her brother's train.

Ballington did not know that each afternoon, as regular as the hour came, the young girl was here to wave her hand at the eagle-eye of the flier. The staccato toot of the locomotive whistle answered her signal with an "All's well!" that relieved her heart. Brother nor sister never failed to be on the watch as the White Crow came rumbling down the grade.

It would have to be a bad storm that would keep Milly Drift at home. Even when he had no regular run, she usually managed to be at the spot and signal him as his train approached Logan City.

She turned at this moment. As she cowered, with the squall beating on her back, she suddenly saw Ballington Serrill approaching.

"Oh!" she cried. Then she recognized the superintendent. "Mr. Serrill?"

Something in his face seemed to alarm her. She shrank as he leaped a fallen log and stretched out his hand to seize her.

"Mr. Serrill!"

Her voice rose to a shriek, which was drowned by a terrific crash of sound that rose above the voice of the gale.

Down upon them came the huge bole of a half-dead forest monarch—a tree wrenched in half by the fierce wind and split from its first crotch down to its very roots.

The superintendent had seen it coming. He caught the light form of Milly Drift in his arms. He turned and ran with her back toward where his horse, snorting with fright, was hitched.

And bearing down upon them came the splintering trunk of the tree, like a gigantic flail, which, had it caught them, would have beaten out their lives. The peril was past in a moment. The girl, huddled in his arms, could only tremble and sob convulsively.

Serrill, making a misstep behind a hidden root, twisted his foot and fell sprawling. She writhed out of his arms in time to escape a fall.

"Oh! you are hurt, Mr. Serrill!" she cried, as he tried to rise but fell back with a groan that he could not suppress. "And I would have been killed— Oh, thank you! thank you!"

She seized his hand in both hers. Her gratitude would have embarrassed him at another time. He struggled to his feet with a gasping cry –a cry of terror. The fallen tree had pitched down the embankment. It had carried an avalanche of earth and boulders with it. The wreck lay across the east track, in the path of the flier.

Through the dashing rain, and down the shrieking wind, came at the moment the prolonged and eery "whoo—who—who!" of the White Crow's whistle.

CHAPTER X.

Trouble Enough.

MILLY was only observant of the superintendent's pain—at first. But as he still struggled to rise, his

countenance working with agony, she understood a word or two that he gasped.

"It's coming! The train — the train—"

Her round, pretty face could not become paler than it had been before. But an awful stillness came into it—a mask which Serrill never forgot.

"Who-o—who—who!" moaned the locomotive whistle again.

She whirled about and saw where the tree had fallen. In an instant the passing of a breath—she realized what threatened the express—her brother's train! -

She dropped Serrill's hand and started for the edge of the embankment. He raised himself on his hand

"Miss Drift! Mildred!" he shouted. "Don't go near there. Help me up. I'll flag it!"

His fingers clutched her flying skirt. She wrenched herself free and darted away without a response

The superintendent staggered to his feet. His ankle caused excruciating pain. He knew that he could not hobble even to the brink of the embankment.

He turned to release the horse. He had a crazy idea of crawling into the saddle, forcing the steed down the hill onto the tracks, and so racing to Hallett Crossing to give the alarm and have the flier halted.

But the moment he released the bridle-rein, on which the frightened horse had been straining, the beast leaped sideways, jerked the leather from his hand, and, in a flash, was off through the forest toward the road!

Serrill uttered a despairing cry. Milly did not hear him—she did not turn to look behind.

Reaching the edge of the hill, she descended it like a swimmer taking a plunge from a spring-board. First a leap, and then sliding down the slope, with a miniature avalanche of gravel and bucket-sized boulders pouring along in her wake.

Providentially she reached the road-bed without mishap. She had lost her hood and ran her hair streaming in the wind, the rain almost smothering her—up the ascent toward the lights of the Crossing.

Again the descending train hooted its long-drawn warning. The White Crow, several minutes late, was rushing down from the Saddle.

Old 67 would be right upon that tree and pile of débris before either Drift or Budd Phelps could see it. Owing to the formation of the bank on the right hand, the direct ray of the headlight would not reveal the obstruction until it was too late.

Milly saw the white spot of the headlight up the hill. How swiftly it approached! In her terror her pale lips opened involuntarily to shriek a warning. She ran on, her wet skirt clinging to her limbs and retarding every step.

Could she reach the Crossing station before the flier? Or, if not, would her figure, revealed in the ray of the headlight, warn her brother in season to stop the course of the train? She doubted the last possibility.

If the agent at the Crossing had only come out on the platform! He must already hear the thundering of the train—Milly could feel the vibration herself. The platform, glistening in the lamplight, was quite empty. It seemed to her as though the forefront of No. 67 was actually at the far end of the platform when she stumbled to her knees upon its lower end.

There stood a sheaf of lanterns by the waiting-room door. There was a dull red glow among them—the lamp she sought! Could she reach it? The roar of the approaching train deafened her Like a crash of cannonading it echoed flatly between the wall of the station and the abrupt hillside which climbed up to the little cottage which Milly and Tom Drift knew as home.

Together, since their parents died, the brother and sister had lived contentedly in the little dwelling. If Tom Drift had ever had hopes of changing his estate, he would have put it aside as long as his sister remained single.

Milly felt in this moment of peril that, if the train passed her and Tom plunged on down the slope to his death, she would fall herself on the platform, killed by the same blow that would end the career of the eagle-eye of the White Crow!

The slanting ray of the headlight flashed past the station—and past the toiling girl. Tom Drift had not pulled

down for the Crossing and was speeding to destruction.

The huge locomotive was abreast of her when she seized the signal lamp with the red bull's-eye. The lights of the cab swept by. She saw the silhouette of her brother against the black pane.

Then she screamed, and tossed the red light wildly in the air!

Her voice was drowned in the noises of the passing cars. But the keen eyes in the cab, ever vigilant for the color of the lamp in her hand, noted as the locomotive swept by the station, that single flash of red

"Hi, Drift! D'ye see it?" yelled Phelps, letting fall his shovel on the iron deck.

The eagle-eye had already shut her off. The squealing of the air rose above the steam exhaust. The long train, halting slowly on the down-grade, came protestingly to a final dead stop.

The locomotive headlight gleamed full upon the pile of débris which had fallen with the tree

Little, the conductor, ran along beside the cars and came to the cab step on Tom Drift's side.

"My soul, Tom!" he cried, "we come pretty near all having our tickets punched through that time, eh?"

"You're right," admitted the engineer, swinging down to the grit. "A bad mess—and who's to clear it?"

"Here, you!" cried Little to the head brakie, "get back and tell the agent to wire down for help. We haven't the men, or tools, to dig all that rubbish away. And that tree's two foot through."

The shack disappeared on the run. He soon returned to the group who, in the light of the conductor's lantern, stood eying the rubbish heap with solemnity.

"Word has already gone down. The agent said he was told of the trouble before you stopped, and by this time old Prendergast will have a gang under way!"

"Who told the operator?" demanded the con.

"The same party that saved us," returned the brakeman. "Did you see that red lamp, Mr. Drift?"

"That's what gave me the cue," admitted Tom. "Wasn't it the station-agent?"

"No siree! He was hugged up inside, out of the storm, he was!"

Budd, leaning from the window of the cab, uttered a sudden exclamation. The others looked up at him

"I thought it was a woman," he said.

Tom Drift turned pale.

"My sister! Milly!" he cried.

"Bet your boots, old hoss!" said Little. "Is that it?"

"That's who it was," said the brakeman. "That sister of yours is sure a mascot for us, Drift. She saw the tree go over and she reached the station just in time to grab that lamp and fling it at yer. Got brains, that girl has."

Drift was proud of Milly. But he could not go back to the station to see her. He was tied to 67 while she was on the iron.

Prendergast had ordered a gang out in short order, and their lanterns were soon visible climbing the grade. They came on a flat hauled by a switch engine behind them. In fifteen minutes after the gang landed at this spot, the right-of-way was cleared and the delayed express steamed down into the yard. There was a good deal of bustle in the train-shed. Delayed passengers, waiting to go east, and others crowding in to welcome arrived passengers.

Drift was swinging himself down from the cab when he felt a touch upon his arm. He turned to see Stranahan, the little police chief. The engineer could not fail to be startled. It had come! What he had been expecting so long was finally arrived. He retained his composure. He had steeled his nerves for this occasion. If Stranahan wished to arrest him he would find him "a hard nut to crack." That is how Tom Drift expressed it.

But what Stranahan said really astonished the engineer—startled him more, indeed—than his own arrest.

"Sorry to bother you, Mr. Drift," said the police official. "You'll have to run your own engine down to the yard this evening."

"Heh?" demanded Drift.

"I have two men on the other side. They've got your fireman already and he'll be taken to the City Hall in a cab.

"You see, Mr. Drift," said Stranahan, argumentatively, "we have had to arrest Budd Phelps. Yes! you've guessed

it. For the murder of Superintendent James E. Serrill."

CHAPTER XI.

What Might Have Been Expected.

MILLY DRIFT, despite her child-like proportions and delicate frame, was a young woman of strong spirit. When the peril to her brother and to the train was past, she did not faint, or show any feminine weakness save that which was physical. She was breathless from her hard run, and had not Smith, the station-agent, come out and caught her on his arm, she would have fallen to the wet platform when the White Crow thundered by.

Seated in the station-master's own chair she recovered her strength while he tapped out the news of the trouble on the mountainside. She was still there when the delayed train started once more for the valley. Her broken story had not informed Smith of the presence of the new superintendent in the neighborhood of the fallen tree. And it was not until after the train had started, that Milly spoke of Mr. Ballington Serrill.

"I suppose they found him and took him back to town, Mr. Smith?" she asked.

"Found who, ma'am?" asked the station agent, in some surprise.

"Mr. Serrill," said Milly.

"Why — er — Mr. Serrill's dead, miss!"

"I mean the younger Mr. Serrill—the superintendent."

"Oh—ay! Mr. Ballington. For the moment you startled me," said Smith.

"And you startled me," said Milly, laughing. "I thought perhaps he had been forgotten."

"Who, ma'am?" demanded Smith, again.

"Why, Mr. Serrill the present superintendent," cried the girl, really anxious now. "Didn't I speak of him? He was there, you know."

"He—he was *where*, ma'am?"

"Down there in the woods—where the tree fell. Of course they found him? He was hurt, I believe."

Smith looked at her with sagging jaw.

"I swear I don't understand you, Milly Drift!" he declared.

"Mr. Ballington Serrill saved my life when that tree fell. Didn't I tell you, Mr. Smith? I was so frightened," said the girl.

"And he fell and hurt his foot. Otherwise he would have run here and flagged the train himself—surely he would! Do you understand *now?*"

"Not much more than previous, Miss Milly," said the man, rubbing his bald head.

"He wasn't found, then!" she cried, starting up from the seat.

"Why ma'am—I don't believe he was."

"Something serious has happened to him," said Milly. "I must go back there to—"

"Through this storm?"

"I came here through the storm," she replied grimly. "I'm neither sugar nor salt."

"For mercy's sake don't go by the railroad again, Miss Milly," cried Smith.

"I'll go by the road—and stop at the house for another hood," she said, and hurried out.

There was nobody to go with her. The agent could not leave the station and most of the men belonging in that little hamlet were railroad employees, and at work at this hour. The girl hurried on alone, stopped but an instant at her own house, and hastened down the road to the grove. Even then she believed that he must have left the place—that either he had gone away on the horse he rode, or had boarded the delayed train and so ridden back to Logan City.

It was pitch dark. She had brought a lantern from the cottage and by its feeble light found her way to the spot where Serrill had tied his horse.

The animal was gone. There was the root over which the young superintendent had fallen.

She was glad he had gone. She would find some more fitting time to thank him for what he had done for her.

She did not return at once. The gale was not a pleasant one to face, and she lingered a little and held up the lantern the better to see the spot across which the tree had fallen.

"I would have been struck down—killed, indeed—if it hadn't been for him," she thought.

It was then that she saw the stark figure lying under the heap of brush. She screamed and ran forward.

It was Ballington Serrill—senseless, saturated, his face as white as death, and —for all she knew—he was dead!

It was plain to see what had occurred. In hobbling after her when she flew down the bank to meet and warn her brother, Serrill had stumbled and rolled into a hollow. His head had struck upon a rock, and he still lay senseless, blood having run from the cut above him temple. The rain, now falling harder, and beating upon his upturned face, had aroused him, perhaps; but it seemed as though it was her cry as she fell upon her knees beside the wounded man that made him open his eyes.

"Miss Milly!"

He tried to struggle to a sitting posture, but for the moment could only recline upon his elbow, and gasp:

"The train! the White Crow—"

"Is safe, Mr. Serrill," she interposed. "It was stopped in time."

"My Heaven! How long have I been lying here?"

"A long time, sir. Forgive me! I thought the train-crew had picked you up and taken you down to the city."

"And -and you came to look for me, Miss Milly?" he said, smiling faintly.

"I was worried—not being sure that you had gone, Mr. Serrill. I am sorry—after you saved my life."

"I am glad to remember that," he said, growing stronger

She blushed again in the darkness. He began to struggle to his feet. Milly gave him her arm and he rose slowly

"How ridiculous!" muttered Serrill. "I am so weak –"

He was far from himself. She saw that the blow, or the exposure, or both, had its more serious effect. He was trembling violently.

"Oh, lean on me, sir! Do, do, Mr. Serrill. I can bear your weight. Your poor foot! Dear, dear! and it is so far to the house."

"I can do it!" he muttered. "I'll walk yet. There!"

He did—for a few yards. They reached the road, where the water ran in a brown flood down the slope of it. But there he had to wait again.

"See the lamp in our kitchen window, Mr. Serrill!" cried Milly, encouragingly. "If you can only get there—"

"I'll make it!" he declared again, and hobbled on beside her, scarcely realizing in his confusion, how much physical dependence he really put on her slight frame. It seemed to Serrill, with his foot afire and his head seemingly as cold and dead as a stone, as though they were hours on the journey. It really took but a few minutes. They reached the step—the porch—the door was flung open. Then Serrill sank upon the old haircloth lounge in the kitchen, and for a few minutes he was insensible again and breathing faintly.

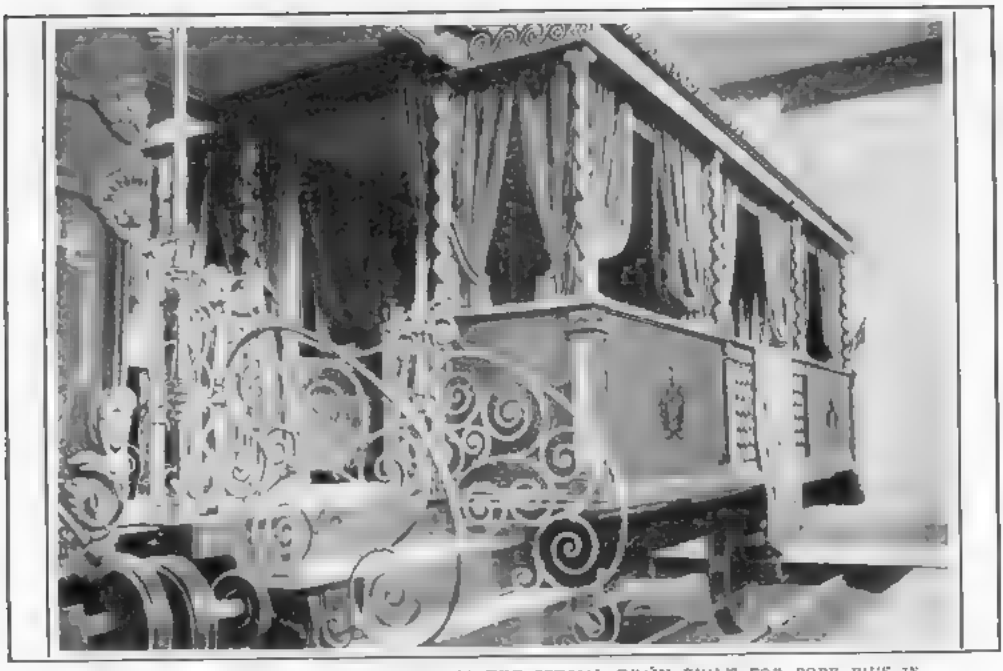
When he struggled back to consciousness he saw Milly coming in at the door once more, hurried and panting, with her unprotected hair wet and streaming. She had run to the station and had Smith telegraph for a doctor.

She did not wait for the physician's arrival before trying to ease the pains of her guest. She had to cut the shoe to remove it from his foot, and removed his sock in the same manner. Ballington's ankle was already black. When she had bathed it and wrapped it in bandages, he swore by all he held sacred that he was cured

Not cured enough for him to get up and walk to Logan City, indeed. Not even well enough for him to get by himself over to the Crossing and have a special engine and car sent up for him. Indeed, when the doctor got there he decried any movement of the patient that night. The wound in Ballington's head had bred fever, and as Drift himself had come with the doctor, between them they put the superintendent to bed in Milly's "spare room," where he remained till the doctor returned in the morning.

Doubtful as he was of the superintendent's friendliness, Tom Drift was too truly hospitable to do anything but make Ballington Serrill welcome. The young engineer could not feel kindly to one of that name. He was still hurt at the treatment he had received from the Serrill who was dead, and he feared that the present young superintendent did not feel as kindly toward him as he appeared.

(To be continued.)



ENTRANCE TO THE OBSERVATION CAR OF THE SPECIAL TRAIN BUILT FOR POPE PIUS IX.

A POPE'S EXPRESS.

Costly Private Train, Specially Built by Napoleon III, Played an Important Part in Saving the Life of Pope Pius IX.

BY MONTGOMERY AMES.

THOUGH it is a tradition of the Catholic Church that the Pope shall not leave the Vatican, his imprisonment is entirely voluntary. Tradition alone retains him within the sacred precincts of Rome No edict has ever commanded that he must not leave. The Pope first became a voluntary prisoner during the reign of Piux IX, who passed through and survived one of the most turbulent periods in the history of Catholicism

Beset on all sides by Italians, under the leadership of Giuseppe Mazzini, assisted by Garibaldi, only the timely interference of Napoleon III and the presence of the French troops prevented what might have been a very serious attack on the stability of the Catholic Church in Rome

In the preservation of the sanctity and safety of Pope Pius IX a railroad train played a part, rather obscure on the whole, perhaps, but at one time during the distressing period it seemed to be vital.

History has little to say of the origin of the train, but the scant records which remain seem to imply that Emperor Napoleon, thoroughly alarmed lest the

Pope should suffer ill at the hands of his enemies, conceived what he thought a plan of protecting his holiness

During the early fifties a railroad was projected from Florence to Rome. Napoleon, cooperating with the proposed railroad company, presented to Pius IX in 1858, one of the most beautiful railroad trains constructed in Europe up to that time. It was built in France and conveyed to Naples by way of the Mediterranean at a cost of $50,000.

Napoleon evidently considered that the train would afford a means of expeditious escape to a safer part of the country should Mazzini and Garibaldi, who were agitating the establishment of a republic, become too belligerent and actually menace the Pope's life

The train consisted of three cars, an observation-car, a chapel-car in which the Pope might hold his devotions, and a sleeping-car. They were equipped in the most luxurious manner of the day and excited much curiosity and admiration wherever they were seen.

For some unknown reason, the gift did not arrive in Rome, perhaps because the projected railroad was never built In Florence, the train's journey came to an end, and here it has lain for many years. It is said that it will be restored and converted into a restaurant for curious tourists.

Several remarkable things transpired during the reign of Pius IX, principal among which, of course, was the continual opposition of Mazzini and Garibaldi to the church. Pius was threatened almost immediately upon his election The very morning following his elevation to the Papacy, in 1846, the Emperor of Austria issued a royal edict commanding that his election should be declared void

This was ignored and Pius immediately began what promised to be one of the most democratic administrations that the church had ever known. He liberated 2,000 prisoners who were being held for various offenses, the nature of which was not known to many of them. He had always been of a kindly nature and he went about ministering to the poor and needy He drew no sharp religious lines. His heart went out to all in distress.

The work so well begun was not to continue for long. The disposition of the Italian patriots was unsettled and rebellious. In 1849 an

EXTERIOR OF THE CAR USED BY POPE PIUS IX FOR HOLDING SERVICES

Italian republic was declared with Mazzini and Garibaldi as the prime forces striving for its establishment. The Pope faced his enemies with as much composure as possible, but was forced to flee

On September 20, 1870, the Italian troops once more entered Rome. This marked the end of the temporal power. Several offers, intended to propitiate the Pope, were made, but he scorned them

EXTERIOR OF THE SLEEPING CAR WHICH COST $10,000.

to Gaeta where he remained under the protection of the French

Emperor Napoleon despatched a large force to Rome. Mazzini and Garibaldi were successfully opposed and their forces surrendered on July 3, 1849. Despite the brief life of the revolution, Pius did not return to the Vatican until April of the following year

Affairs adjusted themselves somewhat and the situation remained fairly placid until the defeat of Napoleon at Sedan which necessitated withdrawing the French troops from Italy.

and retired into voluntary imprisonment Pope Pius was the son of a prominent family of a royal strain. His name before his election was Giovanni Maria Mastai-Ferretti. He was born in Sinigaglia on May 13, 1792, and was educated in the College of Volterra. He did not at first enter the church. He was appointed prelate in the household of Pope Leo XII.

In 1827 he became an archbishop, and in 1840, a cardinal. He died in Rome on February 7, 1878, after a reign of thirty-two years

Engines don't talk, but actions speak louder than words. It's what you do, not what you say, that counts.

GEORGE WESTINGHOUSE.

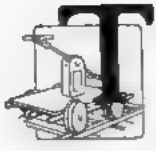
Inventor of the Air-Brake Is the Leader of the Men Who Advocate Electricity as Motive-Power on American Railroads.

GEORGE WESTINGHOUSE, inventor of the air-brake, the most wonderful life-saving [illegible] ever given to the w[illegible] stands to-day as the leader of [illegible] men who are urging the electrification of railroads. It was through his u[illegible]tiring cooperation that the New York, New Haven and Hartford Railroad was enabled to electrify its system from New York to Stamford. Mr. Westinghouse has great faith in the practicability of electrification, but as shown in Mr. Curran's article, there are many problems, mechanical and monetary, to solve before electricity can be used as the chief motive-power of our great systems

ELECTRIC ENGINES AND THEIR USES.

A Description of the Various Types in Operation on Standard Roads Where Electricity Has Been Installed. Their Size, Power, and Cost of Maintenance.

BY ARTHUR CURRAN.



THE status of electrification in this country is of considerable interest at the present time. The majority of articles on this subject have been written with one of two objects in view: either to praise or to condemn electrification. Between these extremes there appears to be a happy middle course which, if followed, will lead to trustworthy conclusions.

Forcing the Popularity.

That the electric locomotive has a field of usefulness, no fair-minded student of the situation will deny. The determination of just what this field is, however, should be left to those who are most competent to judge; namely, the railroad men and the electrical engineers. In the past, there has been too much loose talk on the part of those least qualified to speak. For example, irresponsible and uninformed writers have been guilty of the most preposterous effusions in their attempts to popularize electric traction.

Their ridiculous reasoning can only remind competent observers of the old saying about "hearing the bell ring without knowing where the clapper is."

What is more reprehensible than anything else, however, is the tendency manifested in certain localities to make electrification a political issue.

Obviously, electric traction has no more to do with politics than it has with a rural Dorcas society; but this does not trouble the crafty politician who is seeking the aggrandizement of himself and his friends

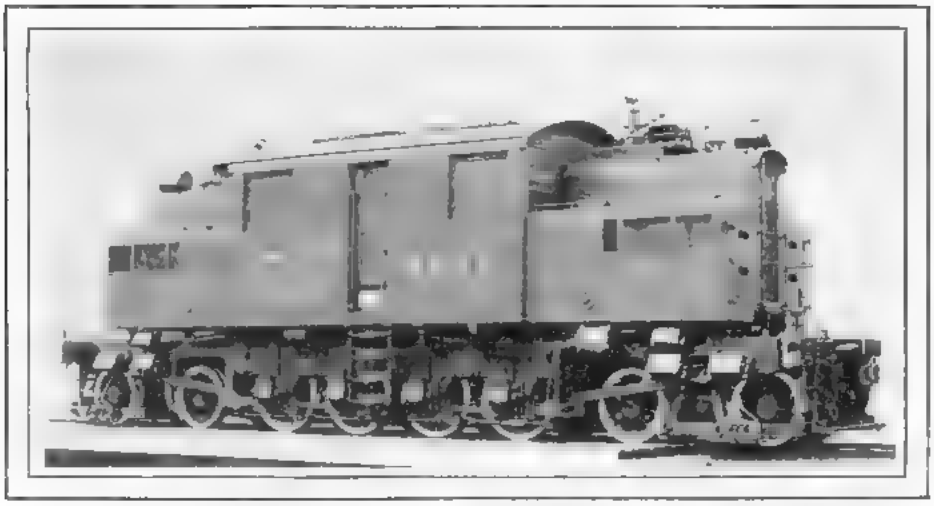
The proverbial "snake in the grass" usually takes the form of a real-estate speculator who wants to unload acres of worthless land on the railroads at sky-high prices. If his little game fails, the shark sues the railroad for damages on the ground that his property has been rendered unsalable on account of the smoke and noise of the steam locomotives

In any event he hopes to get sufficient "swag" to make a rich profit for himself and for the political "heeler" who backs him up and helps him work the trick.

Will Not Revolutionize Transportation.

Electrification has suffered more from the activities of its alleged friends than from the honest criticisms of its supposed enemies. As soon as electrical engineers began to realize that their pet form of power was not destined to revolutionize transportation within twenty-four hours, they commenced the praiseworthy work of finding out where it could be used with advantage.

Their labors have been rewarded since then, and they have incidentally learned to be conservative and deliberate.



HIGH SPEED ELECTRICS USED ON THE NEW YORK CENTRAL TO HAUL TRAINS IN AND OUT OF NEW YORK CITY. THEY COVER A DISTANCE OF SEVEN MILES

As a result, they now urge electrification only where conditions would make such a step consistent. Wild talk about the steam locomotive going hurriedly to the scrap-heap is seldom heard now.

It is a fact worth notice that the installations thus far made have been due to the peculiar requirements of local conditions. One of the most prominent examples of electrification is to be found on the New York Central and Hudson River Railroad. It must be admitted that this costly and elaborate installation was not undertaken because of any preference for electric power, but through force of circumstances.

It must also be stated that the desired result has been obtained, regardless of whether the work is a financial success or not. While a considerable amount of trackage in the vicinity of New York City is involved, the actual miles of line do not exceed thirty-five on either the Hudson or Harlem divisions.

The style of electric locomotive with which operation was begun had four pairs of driving wheels, and was also fitted with a two-wheeled pony truck at each end. These locomotives hauled, without assistance, the heaviest through trains between the Grand Central Station and High Bridge, a distance of seven miles. The guiding qualities of the two-wheeled pony trucks were not satisfactory, however, and four-wheeled trucks were substituted.

The latest type of electric locomotive on the New York Central is shown on page 326. This locomotive weighs 115 tons and is gearless. The electrical data concerning this locomotive are as follows:

Voltage, 600 direct current; rated amperes, 3,000; rated tractive effort, 20,000 lbs.; maximum tractive effort, 35,000 lbs.; speed at rated amperes, 40 miles per hour; total rated horse-power, 2,200; number of motors, 4; type of motors, G. E. 84 (bipolar).

With regard to mechanical data, it is only necessary to state that the driving wheels are 44 inches in diameter, and that the guiding wheels are 36½ inches in diameter. The locomotive was built by the General Electric Company.

Twelve in Operation.

There are twelve of these locomotives in operation, also thirty-five others of somewhat smaller proportions, weighing 100 tons each. Suburban business is handled by 137 motor cars. Two power houses of 20,000 kw. capacity each, equipped with Curtis Steam Turbines, furnish power for the electrical district.

During the preparation for this installation numerous tests were conducted, the electric locomotive used being No. 6000. This was of the type with pony trucks, already described. It quickly demonstrated its remarkable powers of acceleration.

Of course, such capabilities are of no

importance on long runs; but they are of considerable value in terminal work — and that is the service for which the locomotive was intended.

The photograph on page 328 shows the same locomotive with a dynamometer car. Attached to this was a test train made up of a sufficient number of cars to enable the experts in the dynamometer car to secure necessary data regarding the draw-bar pull of the locomotive and other important details

While the New York Central electric locomotives have been among the most successful, no other road has adopted similar designs. Aside from electrical equipment, the principal characteristics of these locomotives may be found in the number and arrangement of the wheels, and in the design of the cab and housings on each side of the longitudinal passageways at both ends of the locomotive. In view of this, it would seem that no agreement regarding electric locomotive design is possible.

In the Detroit River Tunnel.

Another interesting installation is in the Detroit River tunnel. This tunnel connects the tracks of the Michigan Central Railroad in the United States with those in Canada. The tunnel is double-tracked and, together with the extensive yards on both sides of the river, is operated entirely by electricity

It has a carrying capacity of 247,200 tons every twenty four hours. The length of third rail installed in tunnels approaches, and yards exceeds nineteen miles. Power is supplied from the station of the Detroit Edison Company, being generated by Curtis steam turbines. The entire electrical equipment, including sub-station apparatus and six hundred-ton electric locomotives, was supplied by the General Electric Company.

Although the Michigan Central is part of the New York Central lines, it did not adopt electric locomotives of the type used by the chief road of the system. In view of this, and also of the fact that the Detroit River tunnel electric locomotives are of a particularly ingenious and novel design, a somewhat comprehensive description of them may be of interest The electrical data are as follows:

ELECTRIC LOCOMOTIVE STARTING FOR THE DETROIT RIVER TUNNEL WITH A 1,400 TON FREIGHT TRAIN

Voltage, 600 direct current; rated amperes, 1,600; rated tractive effort, 35,400 lbs.; maximum tractive effort, 50,000 lbs.; speed at rated amperes, twelve miles per hour; total horse-power, 1,100, number of motors, 4; type of motors, G. E., 209. The diameter of the driving wheels is 48 inches. There are no guiding wheels.

This locomotive is provided with two four wheeled trucks, a form of construction advocated for its simplicity and economy, and also because of the fact that, thereby, the entire weight is concentrated on the driving wheels.

Similar to Mallet Compound.

Unlike other electric locomotives with this wheel arrangement, however, the Detroit River machines are of the articulated type. The two trucks are coupled by a massive hinge so designed as to resist any tilting tendency, or other disturbance of the running gear.

The two trucks, therefore, instead of being two parts, are really one harmonious unit, having lateral flexibility with vertical rigidity. This is a very important improvement. Coupling and buffing stresses are consequently transmitted through these substantial trucks instead of straining the frame on which the cab is supported.

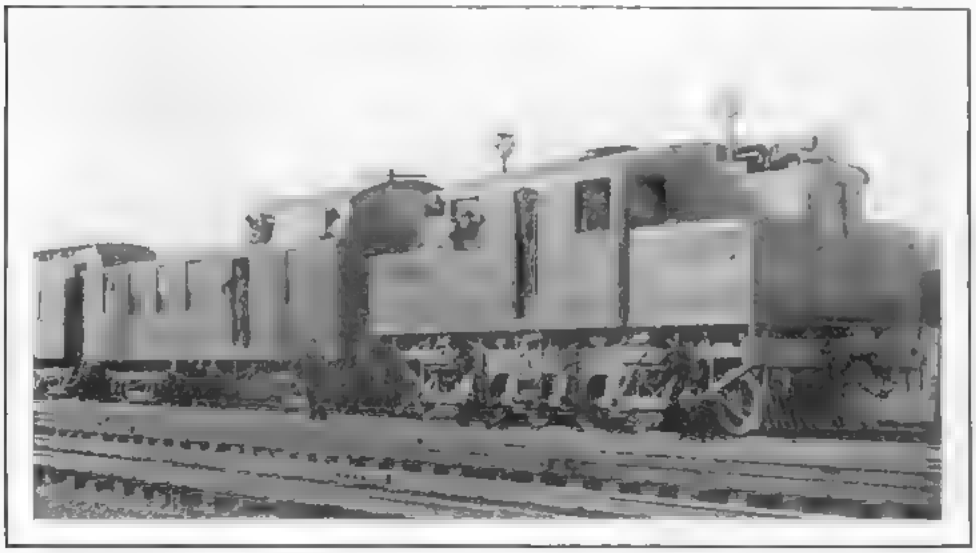
The principle involved is similar to that of the Mallet compound.

The platform is built of four ten-inch longitudinal channels running the entire length of the locomotive and tied together by end channels and bolster plates. Such ballast as is necessary to bring the weight of the locomotive up to the required amount is bolted to the two center sills.

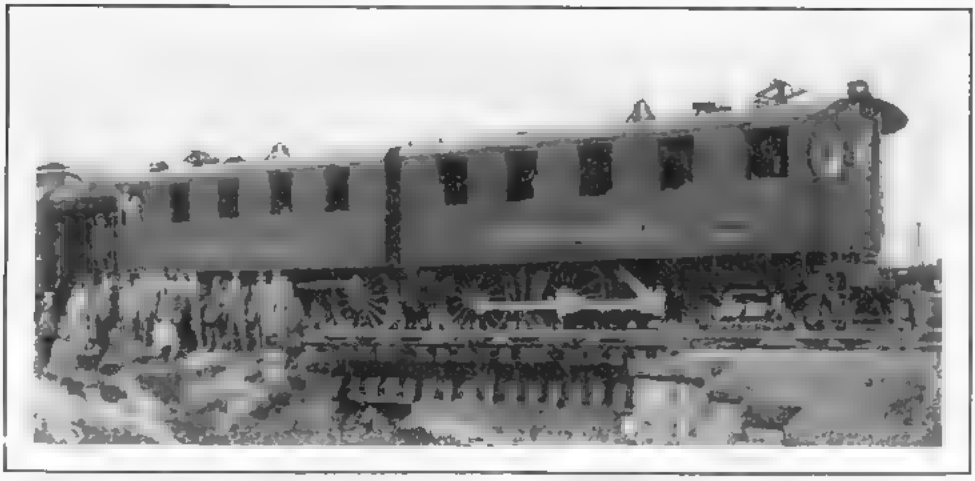
The main operating cab occupies the central portion of the platform, and the auxiliary cabs extend from the main cab to the ends of the locomotive. These cabs house the air tanks, sand-boxes, rheostats and contactors. As for the other features of the locomotive, they are pretty much the same as would be found in ordinary good practise.

This description is of special value inasmuch as it applies to the latest electric locomotives for the Baltimore and Ohio Railroad. Moreover, it seems likely that roads seeking a plain, straightforward serviceable electric locomotive will adopt this type.

The West Jersey and Seashore Railroad, a division of the Pennsylvania System, extending from Camden to Atlantic City, and from Newfield to Millville, was converted from steam to electricity in 1906. The entire contract called for the erection and equipment of a power-house of 6,000 kw. capacity



THE 6000 PULLING AN EXPERIMENTAL TRAIN AND DYNAMOMETER CAR, MAKING A TEST OF HER SPEED AND POWER.



THE BIG ELECTRIC ENGINES PULLING THE TRAINS TO AND FROM THE PENNSYLVANIA TERMINAL IN NEW YORK CITY, UNDER THE HUDSON RIVER TO MANHATTAN TRANSFER, NEW JERSEY, ARE REALLY TWO ENGINES IN ONE THEY HAUL THE TRAINS A DISTANCE OF SEVEN MILES

and eight sub-stations, the equipment of sixty-eight cars, the electrical equipment of approximately 150 miles of single track and the building of seventy-one miles of duplicate high-tension transmission line, all of which work was accomplished in six months from the signing of the contract.

The execution of so large an undertaking in so short a time established a record.

This is, of course, a purely local line, operated on the multiple-unit system s well known in connection with city transit lines

Another installation of a somewhat similar character may be found on the West Shore Railroad. The division of this road between Syracuse and Utica was equipped for electric operation in 1907. The distance between terminals is forty-four miles, in which there are stretches of two, three, and four tracks, bringing the total up to rather more than 105 miles on a single-track basis. Power is generated at Utica by Curtis steam turbines and transmitted at 60,000 volts to four sub-stations along the line. The third-rail system is used for the low-tension distribution. The initial service called for fifteen four-motor equipments, each motor having a rated capacity of 75 horse-power.

Another installation devoted to local traffic is on the Oakland and Alameda Division of the Southern Pacific. Each of the motor cars is equipped with four 125 horse-power D. C. railway motors and Sprague G. E., type M., control, operating on a 1,200-volt trolley

In the foregoing descriptions of representative installations, the main object has been simply to give a general idea of the situation without too many tedious details. What is of equal importance is to consider at some length the problems which have arisen as the result of introducing electric power on steam railroads.

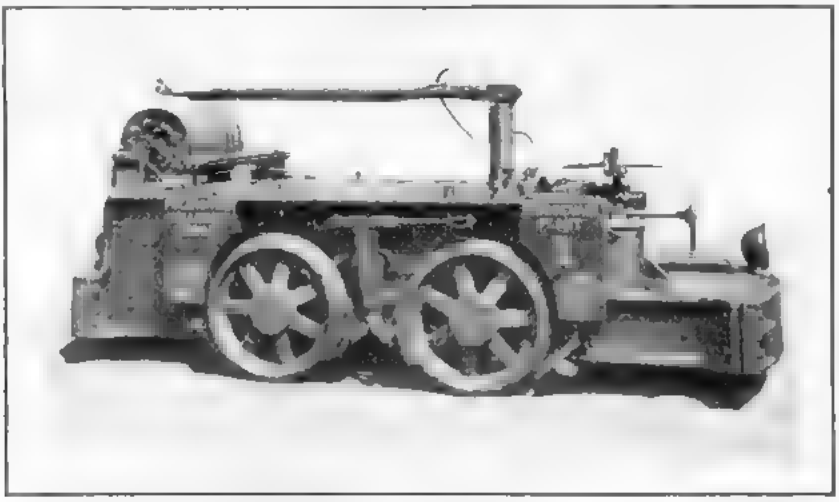
Peculiar "Public Policy."

Electrification, as every competent observer knows, is primarily a business proposition. Beyond that, however, there are a number of mechanical and technical considerations which would, in any given case, have an important effect on the final decision regarding the acceptance or rejection of electric power These vital facts never receive any attention from the hysterical and uninformed advocate of electric traction; and to this may be traced much of the trouble encountered by the roads that do not wish to adopt this form of power.

Perhaps the most preposterous of the many foolish arguments in favor of electricity is that the railroads, if necessary, should be forced by law to electrify their lines on the broad grounds of "public policy!" If this is really a fair example of "public policy," then the

United States of America is no longer a free country.

There is also the old, threadbare argument of the stage-coach. This runs to the effect that the stage coach men made the same resistance to the steam locomotive that railroad men are now making to electrification. The trouble with this little argument is that it assumes a comparison where no comparison exists.



ELECTRIC ENGINE USED FOR HAULING COAL HOPPERS TO AND FROM COAL MINES TO THE MAIN LINE

The steam locomotive is immeasurably superior to the horse, but the electric locomotive does not bear any such relation to the steam locomotive. In fact, there are still many who cling to the belief that the electric locomotive is vastly inferior to the steam locomotive

The class of passengers who patronize limited trains seldom complain either of the treatment accorded them or of the engine which hauls them. If one wishes to study the complaint problem, he must look among the cheaper class of travelers; those, for instance, who ride on commutation trains

It is a notorious fact that those who do least for the railways expect the most from them. Much of the congestion at passenger terminals is due to people whose patronage is of no particular value to the railways, and to whom transportation is furnished at a loss. Yet it is this very same class of people who are howling for electrification and a frequency of service possible only on city transit lines.

There is a belief among serious and impartial students of this problem that the big railway systems, which derive their income from through traffic, both freight and passenger, should not be compelled to groan under the unprofitable burden of passengers who move at low rates.

The plan for relief simply involves the segregation of through and local passengers; the latter being diverted to local transit lines. Where these do not exist, they should be built.

If a solution were adopted, such as I have outlined, electrification would become a dead issue so far as the big railroads are concerned. This does not, of course, mean that no other use could be found for electric traction; but the installations on important roads would be restricted to tunnels, terminals, and other localities requiring special treatment

In this connection, it may be mentioned that the objection to passenger-terminals entered by steam locomotives could be eliminated by using electric switching locomotives. It must be apparent to any one who has visited busy passenger terminals that ninety per cent of the noise is made by switch engines.

This is due to the fact that such engines operate at "full stroke" most of the time and the exhausts are necessarily loud.

The advantage of electric switching is that it would eliminate most of the noise and thus obviate the necessity of ex-

cluding passenger engines from the yards. Incoming passenger trains seldom make any noise, because steam is shut off when entering the yards.

May Have Partial Electrification.

Outgoing trains would, under the arrangement mentioned, make little or no noise because an electric switching locomotive could be placed at the rear end and assist them as far as the yard limits, by which time the steam locomotive could be "hooked back" and proceed on its way.

Such a plan could not be used in New York City owing to the bitter and senseless hostility manifested by politicians toward the steam locomotive. The thought occurs, however, that a judicious expenditure of money for electric switching might save many roads the necessity of ultimately engaging in electrification projects of far greater extent and cost.

Complete electrification of the big railway systems is obviously out of the question, and those who think otherwise are doomed to disappointment.

Partial electrification may come, but not for many years. In the meantime, it might be well to suggest the use of great care in planning installations. Electric power can be a great help, but it can also be a great hindrance. It would be extremely unwise to multiply cases like that at High Bridge, New York. In the aggregate, a vast amount of time is lost in making this unscheduled stop to change from one form of power to another. This time must be made up. With a heavy train it is sometimes hard.

This trouble may be obviated in other cities—if electrification becomes necessary—by electric switching, and by the sensible plan of permitting fast passenger engines to take their trains right through to the terminal. Unless this plan is adopted, the unscheduled stop may, in the future, become an insufferable nuisance.

Electric switching and other installations of a centralized character should prove attractive, owing to the possibility of securing electricity from local power stations.

A man of experience and prominence in the power field recently reminded the railroads that they could avoid the expense of building their own power houses by purchasing current from his company or similar concerns. This looks reasonable enough, and may be accepted.

It is, however, only one of the many details which must be considered, and incidentally proves that the questions in which electrification is involved cannot be settled in an offhand manner.

Points To Be Determined.

Many men have sought to say the last word on this subject, and have settled the whole matter in their own minds to their own satisfaction; but it is not likely that the last word will be said in fifty years.

However, where an installation has been decided upon, a few simple rules may help. In deciding on an electric locomotive, the principal points to be determined are weight, type, capacity, and mechanical features. The weight upon the drivers must be enough to pull the heaviest trains under the most adverse conditions. It is necessary to always state the weight of the heaviest train, the maximum grade and maximum curvature, and whether the locomotive is expected to start the train under these conditions, or whether it will start on the level and only meet maximum grade conditions when running.

If the locomotive is to be used in switching service, the motor equipment can be proportioned to allow heavy overloads in starting on account of the low average load. If the locomotive is to be used in through service the equipment must be proportioned on the basis of the continuous average current, which can only be determined by ascertaining the number of ton miles to be moved in a given time.

There are many disappointments when you are courting; but every main-line has its side-tracks.

A Death Hut on the Desert.

BY
JIM FELLOM.

A NOVELETTE
COMPLETE IN
THIS NUMBER.

STEVE PEMMIGAN started from his blankets and listened into the night. The cry had been repeated. With heavy-lidded eyes he swept the gray blur of plain for sight of animated life. There was none. Neither shape nor blemish marred the colorless sand within range of his vision. The silence was profound.

Reclining upon his elbow, he waited. In the end he surrendered to his growing conviction. He had been deceived. The cry was a trick of his imagination.

Yawning, he returned to his pillow. The thought of next day's trudge over the hot sand toward the far-off, broken range plagued him. Disturbances of this sort went far from assisting to replenish energies, already well-sapped by hard traveling. With a last thought for his burros before he composed himself to sleep, he half raised again and looked over his shoulder.

Both were standing motionless a dozen paces away. To one less experienced than he, they were dozing in that spiritless fashion of the beast of burden. In reality, their staring ears were trained into the west.

Studying them briefly, he sat up, slipped on his shoes, and arose. There had been a cry. There was some unseen thing in the west, even now. He knew the mute, warning signals of those desert watch-dogs too well to doubt. Walking over, he patted them on the flanks.

"Good old fellers," he whispered. "What's over there, eh?"

He lacked a gun, but he rummaged and found a skinning-knife in a kyack. With this in hand, he took off across the sand, straining his eyes into the gloom. Five minutes after he stopped in indecision, listened a moment, then trumpeted to the stillness:

"Hey there!"

There was no answer. Again and again he raised the call, but in that soundless void not even an echo accompanied his efforts. He was grudgingly admitting that burros are as untrustworthy servants as man's ears, when an agonizing wail came out of the darkness.

In the act of retracing his steps, he stopped. There was that pitch to the voice that refreshed his mind to a civilization he had long since renounced through the choice of his lonely calling prospecting. He stood aghast. A woman on the Great Sandy in the dead of night! When, as further entreaty, the cry was followed by feeble sobs, he fixed the direction from which they came, and ran toward them.

Within a hundred yards a little bundle of white loomed in his path. He reached it, catching his breath in astonishment and concern. By the light of the stars, she appeared nothing more than a girl, short, slim, dressed in a mother-hubbard. Her hair, adrift over her shoulders, was thick and sinuous, promising to be a shimmering, silken skein of brown in the sun. She was sitting in the sand, now, her face in her hands, swaying back and forth in hopeless grief.

With only his generous purpose to

excuse the action, he fell on his knees beside her, and drew her back until her head rested in his arm.

"Let's see here," he ordered shortly. He pulled her hands away, and studied her features closely. Satisfied that she did not suffer the tortures that the desert inflicts upon those who want, he was on the point of releasing her, when suddenly she repelled him. She repelled him viciously, clawing and scratching to free herself from his embrace, and adding her screams to her struggles. In the end she drove him off.

"You brute!" she panted, scrambling to her feet.

They stood facing each other—she, gasping in impotent rage; he, confused and silent, wiping the trickling blood from his cheek.

"That's what you are—a brute!" she cried. "There's not a streak of man in you! I wish I'd scratched your eyes out! You beast!"

Pemmigan saw his knife in the sand. He stooped, picked it up, and slid it into his belt.

"I guess I made a mistake, lady," he drawled, cut by her unwarranted abuse; "what's more, I know you did. Good night." He turned on his heel.

He was puzzling over the presence of this lone woman on the midnight plain, and promising himself that he had acted the part of protector for the last time, when she overtook him. Throwing herself upon him, she clung frantically to his arm.

"No, no!" she cried; "I didn't mean that! It's a mistake! I thought you were—Oh, I'm crazy! Can't you see! He's over there—a man! He's dying! You must come! He's dying!"

Clutching the bosom of his shirt, she dragged him along with the strength of a man. This very determination to force him to her will handicapped their progress. He trotted upon her heels and collided with her. The interference nettled him. At last he hung back. There was a short struggle.

"Don't leave me! Please! Don't leave me! He's over there in the wagon! Don't you understand—he's dying! You wouldn't leave me to face it, would you! Would you leave a woman!"

Distracted with fear, she shrieked her pleadings and fought with him.

"No," he cried fiercely. "No! But let go!"

When he jerked away from her a moment after, he had made a discovery. She was armed. In the close quarters of the scuffle his hand had encountered the barrel of a six-shooter through the bosom of her dress. Further, he had satisfied himself that it was a .38. But more significant was the strong odor of fresh-burned powder that hung about her. The gun had been recently fired!

Without replying to her broken words of gratitude, he let her take the lead, and followed. As they sped on he revolved the matter in his mind. There was an ominous relation between a dying man and the smell of a discharged gun, even though it was carried by a woman. A desire to know particulars brought him to her side.

"How did it happen?" he asked.

"He was shot," she informed him, brokenly.

"Who did it?" he repeated, for she seemed not to have heard.

Breathing hard, she slowed to a fast walk.

"An outlaw. He held us up. Fred tried to run him off. He got shot. Don't ask me any more. Please wait until afterward!" She rushed on again, sobbing aloud.

Pemmigan, his lip curling in the darkness, said no more.

In a short time they were crossing an undulating part of the flat. Sand hills began to appear out of the gloom. Through the troughs of these they labored, until gaining an open space where the land resumed its levelness, the man swerved toward a camp-fire that glowed in the distance. He forged ahead now, while she tottered after him, moaning:

"He's lying in the wagon! Oh, hurry, hurry!"

But as Pemmigan ran on he wondered, and felt a keen curiosity to know what caliber of bullet had done the work. Half a minute later he was beside the spring-wagon. One glance was sufficient. It was empty save for a saddle and four water cans. He glanced at the outfit scattered over the ground, then walked over and cast an armful of grease-wood upon the coals. When it burst into a crackling blaze before the breezy stimulus of his hat, he began a hurried search

of the vicinity. He was still so engaged when the woman joined him.

She reeled into the fire-light, her face pale and drawn, her eyes wide with dread. As he confronted her, she read the message in his look.

"I can't find him," he said, watching her skeptically.

With a scream she tore past him and climbed a wheel to look over the high side-boards. A wild glance and she sprang away, scurrying about among the shadows in a mad quest. Pemmigan, though he followed her every movement, hunted no less assiduously. When it seemed they must abandon the search, she found him.

He lay in the gully between two brush-topped hummocks beyond the border of camp. He was dead. The prospector, by the light of a match, examined the round hole over the right eye. It was the clean path of a .38! As much as he knew of such a wound, death had been instantaneous, the man had dropped in his tracks without a groan.

Pemmigan had been on his knees, but now he stood up, grim hostility in his bearing. With bitter words of accusation on his lips, he turned toward her. Then he thought better of it, and said nothing. She was bowed low upon the sand, sobbing convulsively and wringing her hands. Her attitude threw a shadow of doubt upon his conclusions. He contemplated her for a long time, and, unbidden, it came to his mind that she had been sure of finding a living man in the wagon.

His eyes sought the corpse, and he squinted at it critically. There was something grotesque in its position, he thought. It attracted him, and he struck another match. Instantly he understood the body had been moved after death. The fact that it was lying with its arms pinned under it, and that one leg was doubled awkwardly beneath the other, proved this beyond question. The posture was far more unnatural in death than it was in life.

Pemmigan puzzled over this startling development for a few moments, then he slipped away to the wagon. By match-light he inspected it carefully. Two bullets had plowed through both side-boards. He studied the holes.

"The same .38," he murmured.

Straddling the brake-block and front wheel, he bent over the interior. It was smeared with blood. A large pool that had formed under the seat had been trailed over the floor to the very tail-gate. Satisfied with this discovery, he examined the ground in every direction for signs that the body had been dragged away. There were no indications of this. It must have been carried.

Mystified, he went back and stood by the side of the corpse. First, he eyed the small, sorrowing figure in the mother-hubbard, then he estimated the dead man's weight. It was a physical impossibility for one of her size and sex to lift so great a bulk of clumsy flesh. It would have been a task for him, he acknowledged—for any man. Only a man could have done it. A man had done it!

Here was a kink in the chain of circumstances that would not straighten. An outlaw would not stop to hide his kill, particularly where another had been a witness to the deed. To place as many miles between himself and the scene of his crime would have been his whole thought. There had been no outlaw. The woman had lied.

After this, Pemmigan was careful about showing himself in the open. A hat against the sky was too tempting a target for an itching trigger finger on a gun. He stretched out full length upon the sand and meditated on this tragedy of the night. Long after the woman had ceased to moan, and had fallen into a fitful slumber, he was still theorizing.

He pieced together the fragments of facts at his command into a mental picture. Jealousy and intrigue had brought about the crisis. These men had been traveling partners and they had battled over a prize. The woman was the prize. It was plain that she had been the wife of one, but it hardly mattered which now, for she was lost to both of them. Perhaps the truth would never be known; the murderer never apprehended. It was hard to locate a man in that tricky wilderness, much less capture him.

Then he thought of the fresh-fired weapon that the woman carried, and confessed his reasoning had overreached itself.

Day broke at last. There was a smell of storm in the air. Far away in the south, the wind began to moan and cry

where it swept through the lonely lanes of the sand-dunes. Low-hanging clouds poured out of the horizon, like smoke from a stack.

The woman slept, curled against the dead man. Pemmigan rose, got a quilt out of the bedding, and threw it over her. Then he rekindled the fire and looked about him. For the first time he became aware that the horses were gone. Two nose-bags lay on the ground, and a halter dangled from a rear wheel. He found the tracks and followed them some little distance. They led north, and, judging from the way they had trenched the sand, had been made by horses in full gallop.

An hour later his companion awoke. She cried a little, in that queer, pathetic, weak voice that succeeds an overspent emotion. Pemmigan, slicing bacon before the fire, heard it. Somehow the sound stirred him strangely. He was more deeply moved when she sat opposite him, and tried to eat in obedience to his invitation. But she had sunk so far into apathy that even though she rallied obligingly when he insisted, she finished with scarcely having tasted her food. Then, without a word, she went back to her lonely watch.

The meal strengthened Pemmigan's romantic theory of the tragedy. He studied her wealth of light-brown hair and the graceful curve of her face and form, the latter displaying a fetching symmetry even through the capacious confines of a cheap wrapper. She was the type of woman that men would fight over—pretty, coaxing, throbbing with life and warmth

He was in deep reverie when the swish of the storm reached his ears. The first patter of rain fell pattering a mournful melody on the scattered utensils. Stripping the bed of its tarpaulin, he hurried over to her

"We're goin' to have a wet spell," he said gently; "and this canvas is about the only thing that'll shed water."

She moved aside, and he prepared to spread the heavy duck over the corpse. As he did so, he noticed that the body had been stripped of its cartridge-belt. Its shiny imprint from long wear was well marked on the waist-band of the overalls. He finished his task, and dragging a teepee-tent from the outfit, guyed it into place, and signed her to go in. Then the storm burst with fury. Torrents poured out of the sky and thunder boomed.

Pemmigan sought shelter under the wagon. A new obligation had shouldered itself upon him, and he wanted to be alone. In assisting this girl who had come through the night calling for aid, it had not occurred to him that his duty would be more than an immediate one Under the present circumstances, it had assumed the startling character of guide and protector.

He did not relish this. Since it was against his principles to abandon her in this desolation, he must attend her until he could shift the responsibility upon another. Crater Beach, the nearest settlement, was forty-six miles away. He would accompany her there.

But the horses were gone. He was striving to remember if he had ever heard how far a woman can walk in a day, when he thought of his burros. Exultant, he crept from cover, and looked in at the tent. She was sitting on a box, staring hard at the ground

"I'm goin' to take a run over to my camp, missus," he shouted over the roar of the elements. "I'll be back in a jiffy. You better try and get a little sleep."

He was deep in a rehearsal of the events of the night and in wondering vaguely to what extremity his self-appointed guardianship might lead him, when he reached the site of his camp. His outfit was gone! His water-cans alone remained. They were empty.

Dazed, he looked about. With the rain whipping into his face, he stared in every direction. There was not a living thing, nor the indications of a living thing at any point of the plain. Then, he cursed like a full-blooded man, fighting mad. When he at last admitted to himself that his predicament was beyond mending, his mind flashed back to his protegee If the other man was still in the vicinity what might not happen in his absence? Turning, he raced back to camp

He reached it out of breath, and almost blundered into the tent. In a flood of embarrassment he retreated, but she had caught a glimpse of his anxious look and his wet, steaming face with its plaster of long forelock. His

excitement was infectious, raising within her an impending fear that awaited confirmation. Her stupor vanished. Into her eyes leaped a vigorous light.

She peered out, just as he was crawling under the wagon. The very action halted her. There was something so truly self-sacrificing in this strange man. She watched him furtively, as he resigned himself to a seat in the sand and fell to studying the rain-lashed plain. A sense of security stole over her. He was a stranger, it is true, but he had come in her hour of need, and still tarried within sound of her voice. She remembered that he had not slept, that he had prepared their breakfast and been kind.

Pemmigan turned at her call. When he stood before her a moment later, she said:

"I called you in out of the rain. You're just drenched, and—and you haven't had any sleep on my account. I can never tell you how grateful——"

He frowned as if the acknowledgment was unpleasant, then smiled.

"I was waitin' for you to feel more like yourself," he interrupted. "This is the heaviest storm I ever seen in these parts."

"And he took the horses," she tremulously reminded him. "He didn't even leave me that much." Her eyes filled with tears, and she buried her face in her hands.

Clearing his throat noisily, he gave vent to a rough laugh.

"That's all right, sis; he got away with all I had—bed, grub, and jacks. If he needs 'em more'n I do, he's welcome to 'em."

She straightened and fixed him with a look of horror. He returned the grin of a man who had just told a cruel joke.

"He sure put us up against it," he added when she did not speak. "Lucky I know where we are—do you?"

She ignored the question. "Did he steal your outfit?" her voice was harsh and measured. The blood surged into her cheeks, and made them hot with shame and indignation.

He snickered meaningly.

"The wretch!" she cried. "The low-lived thief!"

The interior of the tent brightened perceptibly and Pemmigan rose.

"Well, it's all right, anyhow. The thing is to make the best of it. See, it's clearing. Since it's a case of root-hog-or-die, we better be starting for some place or other. We can't stay here—you can't, anyway."

The rain was still falling, but he shoveled out a shallow grave, wrapped the dead man in a blanket and buried him. All this he did with a certain callousness which he meant should impress her with the gravity of the situation and the need for haste.

"We aint got time for ceremonies," he bluntly explained. "He's better off'n we are."

With the same despatch he prepared the heavy pack, containing liberally of everything calculated to tide them over the weary journey, and looped it over his shoulder.

"Come," he commanded gently. "We'll have to do the best part of our hikin' before the sand dries out. The sun'll be out shortly."

"You're not going to carry that load," she rebelled, blocking his way. "I won't go unless I can help, too. You're treating me like a child. Give me those water-bags, and the tent-pole, and some other things."

He hesitated for a moment, but as she stood firm, he unslung the cargo. She rummaged through it quickly and made the division. Five minutes later they were on their way.

The storm had passed. It was racketing in the table mountains far to the north. Over the dark, southern landscape the sun-patches were lengthening.

For some time nothing was said. Falling into his long, easy swing, she stepped beside him with the even tread of one who has been much afoot. Not once did she look back.

Pemmigan noted this and marveled. He had dreaded that her departure would be marked with bursts of emotion and wild scenes. Now he wondered if that grave really meant anything to her. Then it occurred to him that he was being kept in complete ignorance of facts that it was rightly his place to know.

Who these people were, whither they had been drifting, the nature of the circumstances that had snuffed a life, the miserable man who had escaped with the added brand of thief upon his con-

science—all these were part of a mystery that had its solution in her. The thought that she had made no offer to explain soured him. It was a confidence that should have come unbidden as a natural result of their chance association. He told himself that she was not acting fairly by him. At least in return for his services, she might give him assurances that he was not violating his principles. Might he not be hampering justice through this very aid he was giving her?

The longer he reflected on the guilty aspect of her silence, the more he became determined to break it. He was pondering a suitable introduction when an unlooked for issue presented itself. Straightway the situation took a startling turn and his resolution went to pieces.

They had been trudging along at a rate that promised to lead them into the distant range before nightfall. Suddenly she stopped short. Sinking upon the edge of a sand-bank, she contemplated him steadily. He shifted his pack for greater comfort.

"Where are we going?" The question was put coldly.

"Going?" he echoed, with an astonished frown. "Why to—I'm tryin' to get you out of here, that's all. You can't stay—"

"I know that. But, where—what town, or is it a ranch?"

"Crater Beach."

A short silence fell.

"Well, I'm not going. Not there, at any rate!"

He stared at her stolidly, as if her words carried certain disaster. Then an indulgent smile parted her lips.

"There, I shouldn't have said it just that way. It's horrid of me when you're trying to do all you can. But—but honestly, you could do no more for me than to please me this once. Don't ask me why, only I can't go to Crater Beach." She broke off with a wistful look across the barren flat, and concluded wearily: "If you'll show me another way out, I can go on alone."

He did not reply but swept the dappled mountains with a troubled glance.

"What's some other town?" she asked to end the long silence.

"Iexel," he answered abstractedly. "But that's just it. It's a good ninety mile there—south, through that pass you see yonder." She stood up to follow his gesture. "There's three summits to cross. Crater Beach is only over one divide and there's a ranch on the way to boot."

The woman appeared to weigh this for a moment.

"Ain't there no camps the other way—toward Iexel, I mean? Wouldn't we meet any one?"

"There's Rock Spring cabin. That's in the pass yonder. It abandoned though. There ain't another sign of life after that, 'less you turn off for the Borax Works. Lida Jackson, a Piute, has a ranch at Sulphur Springs. Over east, it's blue sky and real estate, like you see here. We kin go back north to the place you come from—to Hapskulls, if you say?"

Her face was hidden by the spacious sunbonnet, so he could not see the effect of this suggestion. For many minutes she was lost in thought, and he had all but satisfied himself that she would submit when she spoke.

"Well, I'm going to Iexel." She was looking into his eyes and smiling roguishly. "Don't seem so surprised. Let's divide the packs, and I'd consider it awfully good if you would help me with mine, and direct me to the ranch at Sulphur Springs."

Penmigan never had faced such a situation. One thing was clear to him; it was against every tenet of manhood and humanity to desert a woman under the present conditions. For him to leave her to face that wilderness alone was deliberate murder, in his estimation. Many a desert-trotting denizen, old in the lore of that designing land, had walked himself into eternity on just such a trip as she proposed. The dangers were masked and destroying.

On the other hand, were he to accompany her, it was almost suicidal for both of them. They were not equipped for such a journey. They had rations for three days. Ninety miles under a burning sun would require five days' hard walking at the least. The hardships would crush her. Lida Jackson's rancheria was little short of a camping ground for Armagossa prospectors.

"Look here, missus," he began seriously, "there ain't no sense in taking chances this way. Do you know what you're puttin' us up against? We ain't got the grub, in the first place, and there's one stretch of thirty-seven miles between water. It's a crazy idee to —"

"It might be crazy," she interrupted sharply, provoked by his opposition; "but it's not as crazy as what you would have me do—" She broke off as if she had said too much.

"What do I want you to do?" he probed. She did not reply. Instead she tugged and squirmed to get the loops of her pack past her shoulder.

With an angry light dancing in his eyes, he strode up and caught her wrist.

"Leave it on! But, I'm tellin' you one thing, lady, if it wasn't that I think you have a good reason for doin' this, I'd hog tie you and you'd do just what I wanted!"

"Oh, you would, would you?" she flared.

"You bet I would!" he retorted, and favored her with a glance so full of determination that she cooled suddenly With this he led off south, bowing for the first time in his life to a woman's caprice.

All day they traveled. The sun shone as it had for thousands of years upon a world that seemed never to have known a storm. All that day no word passed between them. Always she followed at his heels. This worried him, and often he dragged his gait, hoping she would come alongside. On every occasion, she regulated her step with his and remained in the rear. What was going on under that sunbonnet at his back, he could only guess. No doubt he was being held up as a beast.

The sun was just setting when they came upon the cabin. It was a dilapidated rock affair standing in a bleak, tortuous gulch leading off from the cañon to the pass. One door and a window yawned a cheerless greeting. Some little distance up the coulee, a clump of black willows showed the position of the spring the only water as Pemmigan knew within a ten-league radius.

"This is Rock Spring—the shack I was tellin' you about," he said, after he had helped her to unsling her pack and wriggled out of his own.

There was a strange ring in his voice. She distinguished it and regarded him curiously. It struck her that his face was drawn about the mouth, and that a smoldering fire lurked in his shifting eyes. Something, too, seemed to have entered into his manner, something akin to unholy eagerness, which his determination battled to subdue. His hand trembled. When he again spoke the mood had passed.

"It's been abandoned nigh onto fifteen years."

She vouchsafed no reply, but entered the small room, and, under pretense of inspecting it, watched him. But, whatever the emotion, he had mastered it. Only in one respect did it proclaim its presence. Standing on the threshold, his glance wandered here and there over the interior. It appeared to linger with more than that casual interest a man might have in four crumbling walls. It recalled to her the return of a wanderer to the scene of his birth.

After a little he began to clear the floor for occupancy. While he sweated at his task, she untied the outfits and gathered chips for a fire. She was engaged at this when he joined her.

"Here," he said with some concern, "you've done enough for one day, missus. Take a rest for yourself—I'll fix supper."

Obediently she took a seat upon a rock close by and watched him cut a swath through the stunted, dead brush with his heavy boot. Then he broke off the twigs and piled a corner of the cabin high with fagots.

"My brother was killed right in this shack," he informed her.

She started, then found her voice with difficulty.

"Your brother!"

"I'll tell you about it when I come back."

He picked up the empty water-bags and walked away to the spring.

She followed his big, slouching form, and a kindly expression replaced the frightened look that his remark had occasioned. Even after he had disappeared among the willows, she kept her eyes on the spot. Some poignant emotion stirred within her. Her lips twitched, and instinctively she raised a trembling hand to quiet them.

When he finally reappeared carrying the two dripping, bulging sacks, she had regained her self-control. As readily as she had recognized the change in his countenance and manner a few minutes before, so also did she mark the expression he now wore. There was a cruel set to his jaw and a black furrow on his brow. At a little distance she noticed that his eyes flashed evilly, and that a yellowish pallor had settled into the tan of his face. His humor, too, was almost hostile, for as he shouldered past her into the cabin, he gave her neither word nor glance.

Hanging the water-bags on two wall-pegs, he started a fire in the large fireplace while she, anxious and fearful, stood motionless behind him. When the blaze was roaring into the chimney, he rose from his knees.

"You won't mind cookin' up a little bite, will you?" he asked huskily. "I said I would, but —"

"Certainly not," was her hasty reply.

He mumbled a word of thanks, hesitated, shot a look into the flames, then fixed her with a cold stare.

"Hand over your gun!"

She staggered as if he had struck her, and her face went white. Involuntarily she clutched her bosom.

"Yes, there!" he continued, noting the action. "And gimme all the shells too! Right away!" He stopped and bent a quick ear into the stillness. "Give it here, I say!"

Trembling with terror, she handed him the weapon together with a quantity of ammunition which she took from the pocket of her wrapper. He turned the six-shooter over in his hand. It was a .38 and he smirked knowingly. There were also three empty shells. These he threw out and replaced with loaded ones.

"I might as well tell you," he said in a hard voice, as he stood ready to go, "that we got a neighbor. There's horse and burro tracks at the spring yonder. They ain't over an hour old —and they're my burros!"

A cry escaped her. She wheeled toward the wall for support, her breath pouring in short noisy gasps through her parted lips.

"I'm jest tellin' you," he added, touched by her distress, "'cause you can't tell what'll happen. If I got it right, you'd better lay low. I'm goin' to look over the country. I don't care much to be pot-shotted and not be lookin'. I'll be back presently."

He left her, a weak, quivering, stricken creature who stumbled helplessly across the floor in his wake Hanging to the portal with despairing grip, she followed him with horror-bright eyes as he strode up the bare bed of the gulch like an unsuspecting camper filling his evening duties.

With his disappearance in the shrubbery, she crept back into the room. For a moment she swayed in pitiful indecision, then, as a new fear burst upon her, she paced about wringing her hands.

"Oh, why did I let him go!" she wailed. "He'll find him! Oh, I know he'll find him!"

Then she grew suddenly quiet and listened. From without came the sound of footsteps hurrying over the loose clinkstone. They approached and her heart stood still. A sudden rush of fears assailed her, and she was on the point of springing to the door when a man flitted by the window and stopped upon the threshold.

With a quick, wicked look over the interior, he entered and stood before her He was a raw-boned, sinewy fellow with a smooth, wide face. There was a scar on his jaw, from a plowing bullet, that had mended badly, and the first two fingers on his left hand lacked two joints each. In his right he gripped a .45

The woman started back at sight of him, and regarded him with scorn.

"Who's that you got with you?" he hissed unceremoniously, "and whatcher doing over here, eh?"

"That's my business!" she cried. "One thing I can tell you, he's not a— he's a man. What do you want here? I'm through with you, now, this minute, for good! I came this way when I had a chance to go out by Crater Beach, if you want to know! To get away from you! To never see you again! I'm going to Iexel, and he's going to take me! I'm through with you!"

The man walked to the entrance and peered out. The sun had set, but the sky was still smeared with gold that transformed the high pinnacles of the range into a bristling multitude of fiery needles.

"You're pretty spunky, Rose," he said with a cruel curl of the lip, as he again faced her. "But, don't you forget that I'm your husband, and I can mighty soon make you come to your oats. What's more, you can't testify against me. You go to work and make it bad for me by dragging this fellow into the thing. You forget your duty to me. You—"

She stepped close to him, hatred blazing from her eyes, defiance in her bearing

"After what happened—after what you did?" she choked. "After you killed a man in cold blood? A man who put up his outfit against your grub—your partner?"

His face darkened evilly as he lashed back:

"Yes, a man that would have killed me the first chance he got. Didn't he start it? Didn't he shoot off his head about my being too rough with you, when I'm your husband? What if I hadn't been looking? Him in the wagon, and me in the open, eh? I'd be where he is now, wouldn't I? Curse him, he was too darned sweet on you to suit me, anyhow!"

"Sweet," she gritted, "sweet, because he tried to protect me from a brute like you. If I hadn't fought that revolver away from you, you'd have killed me! Yes, you would have! Didn't you leave me alone—deliberately steal the horses and leave me to die, alone on the sand? And you tried to bury him, didn't you, so no one would ever know? And you didn't have time, did you? This stranger knows! The man whose camp you robbed—robbed, you understand!—My husband! What a proud—"

Towering with rage, he caught her brutally by the shoulder.

"That's enough!" he cursed.

A cry escaped her and she tried wildly to beat him off. Over the floor they struggled, and because she was slipping from his grasp, he dropped the six-shooter to get the use of his other hand. It fell under the window.

Redoubling his efforts, he backed her across the room and pinned her, choking, against the wall. With a red glare in his eyes, he raised his fist to strike. Then he stopped and listened.

In that short period she mustered her scattered energies. The weapon lay three paces away. With one supreme effort, she tore his hand from her throat, leaped past him and snatched it up. She checked his lumbering advance with the glittering barrel just as footfalls broke upon her ears.

On the instant her loyalty rose to the occasion. This man, murderer though he was and thief, was her husband. He would have strangled her no doubt, but for all that he was her husband. This other was a stranger—with all his merits he was a stranger. She swept the cabin with wild eyes.

"Gimme it, Rose!" spluttered the fugitive, his hand clawing for the revolver. "I won't be taken! I won't be taken alive, I tell you! Gimme it!"

She crowded him back, driving him into the corner.

"Hurry! The tent—get under it!" she gasped. "Hurry, I say! Will you—"

Desperate with fear, she struck him in the face as he persisted for the weapon. And reluctantly he obeyed her, gritting his teeth in wild rage.

The next moment, when Pemmigan entered, she was calmly engaged spreading a garment over the bundle of canvas.

"Beg pardon," he stammered, and turned on his heel.

"Come in—it's only an old skirt," she hastened to explain. "I'm trying to dry it out." She arose and caught back her hair, ending humbly, "I'm sorry, but I haven't even the water on yet."

He laughed good-naturedly.

"Good! That'll be only givin' me the chance to show you that you womin ain't the only cooks. You jest sit down and take it easy."

She was glad to comply with this injunction, and took up her position on the ground before the tent and its secret. While he prepared the meal, she kept a careful watch upon him, her husband's pistol held ready in the folds of her wrapper.

Pemmigan's mood had changed. Strange to say, he was in the height of good spirits. He talked and talked. He retold his stock of jokes, and laughed uproariously. He regaled her with stories of the desert, of his travels, his successes and failures—mostly failures. While they ate, he talked, and when he stretched himself in front of the fire and

smoked, he was still talking. He was strangely entertaining, she thought, and wondered. Also, she was worried because he said nothing concerning the search he had made from the shelter of the willows.

When it grew late and she knew he would soon go, she allowed herself an occasional question, not that she was not interested in his narrations—they were meaty with the throb and beat of the frontier—but, because a relief was slowly replacing the nervous tension she was suffering.

Time after time she interrupted to ask and time after time he answered. She admitted that he was such company as would make the days pass in a cloud of dreams. How much had he not undertaken? What had he not done? The wretch cringing under cover of the tent behind her—what manliness did he possess compared with this stranger of the wilderness?

"And, you are never lonesome? Never feel that you could take up some other life?" She asked this when he spoke of the unbroken solitude and its charm.

For answer he laughed once, then for the first time let his eyes hang vacantly upon the leaping flames. He grew strangely silent.

She watched him with growing entreaty in her eyes. The night closed in with all its unmentionable threats and fears. If he would only continue. She had not offended him, she knew, for instinct told her she had struck deep into one of those secret, intimate memories that men look back to in their prayerful moments.

"Tell me some more," she coaxed, after a long wait. "I like to listen."

The man beneath the tent thumped her sharply, and under pretense of changing her position she returned the blow. Pemmigan flashed her a smile, and dragged on his pipe

"You was sayin' somethin' about bein' lonesome," he began gravely. "That's the same as being scared, with me. And there's only one place ever had me scared. That is, not bein' scared so much as wantin' to stay away from it, and at the same feelin' that I would like to go and stay right there, and jest knowin' I couldn't. Ever feel that way about a place? Jest like you sorter knew somethin' would happen, 'cause somethin' had happened? I don't know that you get me."

"Yes, I do," she nodded encouragingly, but did not understand him.

"Well, that place is right here!"

"Here?" she echoed, trying hard to grasp his meaning.

He took the pipe from his mouth, and knocked the ashes out upon a rock with slow, reflective strokes

"Yes, right here. Recollect me tellin' you what happened to my brother? Well, I came this way once, and I couldn't get closer than a mile. I jest wanted to, but I was scared of myself. You see—but, missus, this ain't the best kind of a story to tell you after what you've gone through to-day."

Tragic though she knew the tale to be, she was stirred by an unaccountable desire to hear it.

"Go on," she exclaimed. "Please tell it to me."

"Well," he acquiesced, refilling his pipe and lighting it, "it's fifteen years this September that my brother and a partner he'd tied to in Daggett finds a silver-lead outcroppin' 'bout a half mile up the next cañon west of here. It's a good thing and they sticks up this cabin and starts to work it. I'm in Keeler at the time. 'Bout six months after, a feller who's buyin up claims for a Frisco concern, hears about it and comes out to look it over. He goes plumb crazy and wants to buy.

"My brother and his partner holds out for a pretty stiff price—twenty-five thousand, I think it was—and he can't see it. He's a mighty keen buyer, and knows that the general run of poor men don't know what twenty-five thousand looks like. He works on this theory, see, and he's right. For a whole week he digs 'round among the ranchers and business houses up and down Owens Valley, and gathers in all the gold and silver and paper money he can. Inyo County is shy of coin, I recollect, and all he gets is four thousand dollars. But it's an awful big pile, and he drives out here with it.

"Again they talked it over, but my brother and his partner hang fire on the price until the city chap dumps out the four thousand and pulls out the papers all drawn up.

"'Take it or leave it,' says he.

"Well, they ain't never seen so much money at one time, and they can't get ahold of it soon enough. At that, they're ahead of the deal 'cause the mine petered out. Anyway, this feller goes, and my brother and his partner starts to pack up. That's on the 5th of September. On the 12th, I gets word to come to Crater Beach—that my brother is killed.

"They find him in bed right in this here cabin, stabbed to death. I ain't seen the partner or the money to this day. That's why I didn't ever like to come this way never, and I wouldn't'er if you hadn't jest felt you had to make lexel."

He reached out and tossed a handful of brush upon the coals. They leaped into flame with a crackling hiss.

A long silence followed.

"I'm sorry I was the cause of you coming," she said at last, in a quiet voice. He thought he read compassion in her eyes, and smiled reassuringly.

"And I'm glad you did," he answered frankly. "You've broke me of a habit that I never did admire. I always felt that if I ever stood in this here room, and looked around, and thought real hard, I'd never stop 'til I had the murderer right where I wanted him. I was scared of myself, as I said before, like as if it would change my whole life, and I didn't want to do that. Now, that's all past, and I know how him and me stand."

She thought for a long time after this. The man under the tent stretched a cramped limb stealthily. Pemmigan drew peacefully on his pipe. Would he ever go? From the distance came the swish of the night wind tearing through the craggy heights

"You'd know this man, wouldn't you?" she spoke to continue the conversation, and scarcely knew what she said.

"Yes," he replied, in matter-of-fact tones. "It's not in the cards to forget that. He's a tall, big-faced, blond feller with two fingers gone off his left hand. His name's Len Skelly!"

She shivered, stared blankly at him as if she doubted her ears. Slowly her face blanched. It turned ashy and drawn. To strangle the cry of despair that rose gurgling in her throat, she broke into a heavy, rattling cough. It crashed through the stillness, starting fearful echoes. The man in hiding trembled violently. But Pemmigan seemed to be dreaming into the depths of the fire and heard nothing.

Half addressing himself, he supplemented:

"I'm like all the rest of the sourdoughs—no matter what you do, it's one of the things you're supposed to do, and either way you can't side-step it."

With this he yawned, shook his big shoulders, and looked at her. But he could only catch a glimpse of her face. With a cheek resting in her hand, she kept it toward the fire.

He rose and stretched lazily.

"I'm goin' to stand guard. I don't think there's any danger, but it's better to be sure. You make yourself comfortable. If you need me, jest holler."

He went out of the door before she could think of anything to say.

Hour followed hour with maddening slowness. A wood-rat, emboldened by the silence, looked in at the window, sniffed this way and that, and scampered back into the darkness. From the clump of willows came the clear song of the cricket.

The woman sat motionless, looking at the dying flames, until they passed into smoldering coals and the old room grew cold with heavy shadows. Then a movement behind her recalled her to the situation.

Noiselessly, Skelly worked his head from beneath the canvas and raised upon his elbow. She shrank away with a loathing that even the descending darkness could not hide.

"Rose," he breathed hoarsely, "gimme that gun!" The whites of his eyes gleamed like two little rings with red centers.

She was on her knees now, just out of reach of his arm

"Give it to me, I say!" He lurched to a sitting posture and made a quick snatch for her dress. But she had anticipated this and eluded him.

"So that's what you were!" she hissed passionately. "A murderer! Thief! You deceived me! A rich mine owner! You lied. Oh, you beast! Bought me with blood money! Bought

me—this wedding ring is bloody! Is cursed!" She tore the band from her finger and flung it in his face. "Oh, that I had died! That I had died you wretch! I hate you—I hate you!"

Stumbling to his feet, he hugged the wall like a cornered animal, murderously active and ready to spring. But she rose with the upraised six-shooter in her hand.

"Shut up! Shut up!" he pleaded and cursed all in one breath.

"In this room you killed him!" she gritted, flinging the words into his very teeth. "In this room! The man who trusted you! His brother is here now! He'd be glad glad of the chance! You cowardly traitor! And you come here looking for me! Here, where you killed a man fresh from killing another! Here, where you sneaked up and knifed him in his sleep, took his money—married me! Deceived me with your lies! Oh, you terrible brute!"

She stopped exhaustedly, then staggered aside.

"Go! Go! before I forget and call him. Go!"

"Gimme my gun, then!" he sputtered desperately.

Panting with passion, she stamped her foot, her words rasping hysterically on the silence; "Will you go?"

With a terrifying burst of profanity and threats, he slunk out of the cabin. Then like a sinister thing of the night, she stood—stood, and watched, and listened. Five minutes, ten minutes went by, then

"Help—please—come!" she shrieked, and sank to the floor in a violent flood of tears.

Pemmigan did not come. Again the minutes slipped away, while the hollow echoes of her lamentations alone broke the stillness. Again she called, and wept aloud to make known her distress. There was neither the hurried step, nor the answering call that she knew should have come. As a result she became fretful, then frightened. Her sobs stilled. The night was soundless, even the plaint of the crickets had ceased.

Trembling at the terrible thought, she crept cautiously to the door. Had that wretched man, her husband, blundered upon her sentinel and finished him? It was too dark to see, and she had almost nerved herself to investigate, when from the direction of the spring came the sound of hurrying steps.

In a panic she stole off to a corner of the room, and waited with the .45 trained at the dim rectangle that marked the entrance. The next moment Pemmigan stepped into the room.

"It's me, Missus Skelly," he said simply.

He stumbled across to the fireplace, shook up the embers and fed them.

"I heard you, but couldn't get here any quicker. There, that's better." The dry wood caught and bathed the interior in a cheerful light.

Pemmigan looked about until he discovered her. She was standing in a far corner, drawn up to her full height, the tiger still in her eyes, the heavy gun glinting at her side. They studied each other for a while, her blood freezing rapidly before the significance of his easy smile. Finally he spoke

"Well, he's gone!"

She shrank instinctively, the weapon slipping from her grasp.

"Gone?"

"Sure!" Then, as he read the horror in her eyes. "No, not that way. I gave him a chance. That's more'n he ever gave my brother." He pulled the tent before the fire and stretched himself full-length upon one end of it. "Have a seat—it's goin' on to mornin' now, and we better sit it out."

Trembling and fearful, she crossed the room. He waited in silence until she had taken up her position opposite him

"It was a pretty rough deal I gave you," he continued, meeting her wild, fascinated stare with speculative gaze. "And I'm mighty sorry it upset you so, even if it was your place to know the facts. This evenin' when I went after water, I seen him snoopin' 'round, and I knew him on sight. Then I give him a chance to see you jest to trap him. There's a little hole in the wall back of you, and I seen him when he dropped his gun, and when you picked it up. I told the story so's you'd understand.

"Then I laid for him when he left, got him straddle of a horse and tied him on—yes, sir, tied his feet together, that's all, but I cinched 'em up close under so's there's no gettin' 'em loose alone.

"'Here,' says I; 'Crater Beach is your

nearest point. You got a quart of water and a horse that'll just about make it if you take him easy. You know the way—take your ch'ice!'

"So it's up to him. If he's headed for Crater Beach, he's as good as in the calaboose now, 'cause there ain't one man in Owens Valley but what don't know Len Skelly. But if he's loco enough to buck the eighty-two miles to Hapskulls or the seventy-seven to Iexel, that's his own lookout.

"It's a case of heads-I-win-tails-you-lose with me. In other words, he's his own deputy, and is responsible to himself for himself. That's all, only I'm awful sorry for you, 'cause I think you got in wrong and didn't know it.

"To-morrow we'll hit it up for Iexel, if you say so."

As he ceased speaking, a fluttering sigh escaped her. He threw an armful of brush upon the fire and lay back watching the dry stuff kindle. When he looked around again, her head was bowed upon her breast. Lighting his pipe, he smoked on in silence, his eyes sparkling brightly in the flare of the flames. After a long, long interval, she spoke.

"No—I'm going to Crater Beach." It was a sad, tired, hopeless voice, and as he turned he saw two large tears fall into her lap.

Then as the dawn crept into the room, Pemmigan shook his head and marveled at the devotion of womankind.

TRAIN WAS TOO PUNCTUAL.

EXTRAORDINARY scenes were witnessed at the Gare St. Lazare station (Paris), one evening recently, owing to the unpardonable punctuality of the train leaving for Vielennes. Intending travelers who strolled leisurely up to the station mentally remarking, "*L'Ouest-Etat est toujours en retard*" (the West-State railways are always late), saw to their surprise and indignation the tail of the train disappearing from the station.

A furious crowd at once surrounded the stationmaster, and one would-be passenger, with a volley of reproaches, shook him violently and then struck him. A station policeman intervened, and at once there were two angry, gesticulating camps on the platform—the station staff and the infuriated travelers.

Blows were freely exchanged, and finally other police had to be called in

They were in turn the objects of attack, and, according to one account, they had to draw their sabers in self-defense. Two arrests were effected, one being that of the individual—a lawyer—who opened the fray, and the other a young painter living at Courbevoie.

One of the policemen had to be treated at a neighboring chemist's for a finger which had been bitten in this extraordinary affray. A doctor had also created a disturbance in the morning because the train had left punctually, and the "League of Passengers" is inclined to support both the doctor and the lawyer in bringing their case before the courts. Their argument is that either the trains must keep approximately to time, or else be approximately half an hour behind, but that it is intolerable that one should start to the minute and the next one be three-quarters of an hour late.

Speaking from personal experience, last Sunday I took a train at an hour's distance—about fifteen miles—from Paris, which should have brought us into the Gare St. Lazare at 9.40. We reached Asnières (halfway) in a little more than an hour, and there stayed till half the passengers elected to get out and find their way home by tramcars or on foot. Luggage and passenger trains kept passing ours, and frequently two or three trains were drawn up alongside each other, allowing a liberal exchange of opinions on the methods of the railway company. It was a quarter to twelve before we finally reached Paris, having taken three hours over a distance which could easily have been covered in a cab in less time.—Paris correspondence of the London *Standard*.

A man without balanced abilities is as inefficient as an engine with a broken rod.

HELP FOR MEN WHO HELP THEMSELVES—NUMBER 47.

THE BOILERMAKER'S WONDROUS WORK.

BY ROBERT H. ROGERS.

Men Whose Skill and Vigilance Maintain the Very Life of an Engine, Toil Heroically in Baking Fire-Boxes When Duty Calls.

DURING the last annual convention of the American Railway Master Mechanics' Association at Atlantic City, the writer asked of one of the leaders of the mechanical world, "What do you consider the most important accessory to a locomotive—boiler, valve-gear, or what?" The answer was, emphatically, "The boiler."

It was pointed out that no matter how highly developed or how efficient the other parts may be, their good points cannot be exemplified without the maximum power which the boiler supplying them is designed to produce. In other words, if you haven't the steam, the best and most economical valve-gears, cylinder-packings, etc., will be as naught.

For this reason it is probable that more attention has been given to boiler design, and in particular to boiler maintenance, than to any other feature of locomotive operation.

The development of the locomotive boiler has been fully traced in the RAILROAD MAN'S MAGAZINE from its incipiency to the present time, and it is not my intention to go over that ground, but, instead, to show the skill, experience, and unceasing vigilance which are required to maintain it from the point of efficiency and safety.

In the old days the low steam-pressures carried, and the large margin of steam production over the demand imposed upon it, resulted in the care of the boiler being considered a very simple proposition. It was also a railroad proposition, pure and simple. The railroad tested its boilers whenever so inclined, washed them out when it was thought necessary, and renewed the stay-bolts at sporadic intervals.

From the point of mechanical ability, the boilermakers of the past were as good if not better mechanics than those of to-day; that is, they were more cunning of hand and, no doubt, more resourceful. This is because none of the labor-saving devices now so prominent in the trade had been invented. There were no pneumatic hammers, no air-drills.

Practically none of the adjuncts which simplify our work were found in the shops of our fathers.

Began in the August, 1907, Railroad Man's Magazine. Back numbers for sale at this office.

When there were stay-bolts to remove, those old fellows chipped them out by capping into them and knocking the shell down. Now they drill them and knock away the shell.

Worked Laboriously by Hand.

If they had flues to bead it was done laboriously by hand with a heavy hammer. Now the beading-tool performs the operation in a jiffy, and with scarcely any manual effort

Notwithstanding all the dexterity exhibited, however, the trade of the boilermaker, as exemplified by the old-timers, was considered of "rough neck" caliber, and lacked the prestige of the machinist. Opportunities to acquire the calling were numerous through apprenticeship, but the skilled work was so laborious that the boys did not take kindly to it.

One of the first requisites was that the applicant should be a "husky," otherwise he would be left on the start. Only strong lads could handle the heavy tools of the period, and a majority of aspirants for positions in the rank and file of the motive-power department preferred to ally their fortunes with less strenuous trades. Then, again, it was expected that a man serving his time as a boilermaker apprentice should develop ambidexterity.

There were two reasons at that time why a boilermaker should be able to use either hand with equal facility. First, because he was continually swinging a heavy hammer. By being able to change off he would escape considerable fatigue. Second, because some jobs, such as heading flues or cutting down stay-bolts, could not all be reached by a man skilled only to use one hand.

To-day you can cut down stay-bolts with the up-to-date tools in vogue, whether you are right or left handed, and with twice the speed of the old days.

Without disparaging the skill and fidelity which undoubtedly characterized the pioneers of the trade, the fact remains that its roughness partly acted as a drawback to the enlistment of a better educated class of young men who aspired to preferment in railroad service.

This largely explains why a boilermaker of the old days seldom, if ever, rose above the position of boilermaker foreman. There is no record of one having attained the position of general foreman, and such a possibility as that of becoming a shop or division master mechanic was unknown. It was an occupation ranking in railroad service with that of a molder or a blacksmith. The highest reward expected would be to take charge of the shop in which employed.

In striking contrast, and to show the dignity to which the trade has been raised, may be mentioned the career of E. S. Fitzsimmons, who started on the Delaware, Lackawanna and Western as a boilermaker, was promoted to be general boiler inspector, served in that capacity on both the New York, New Haven and Hartford and the Erie, was made master mechanic of the Erie, and is now holding the responsible position of mechanical superintendent of its western district, with headquarters at Cleveland, Ohio.

This promotion is significant of the fact that the boilermaker has now an almost equal chance with the machinist, who formerly regarded it as his individual perquisite to rise to the highest offices in the motive-power department of a railroad.

It is not now necessary for him to remain stationary after being promoted to foreman.

On the contrary, he can aspire to anything which his company has to offer in the mechanical line.

The boilermaker of, say, 1890 was fortunate if he received $2.25 a day. A foreman was lucky if his check called for $75 a month. To-day a boilermaker is paid from $3.25 to $5 a day, and his foreman would consider himself poorly paid without a monthly recompense of from $125 to $200.

Development Demanded Improved Devices.

The enhanced importance of the trade dates from the time that the first "big" boiler made its advent, which was synonymous with the period when State supervision included the inspection, or, at least, the observation, of this important detail of the locomotive.

Large boilers implied much more difficult problems in their design; keen and progressive men were required for their

solution, and thinkers, rather than drivers, were sought as foremen. Gradually brain largely supplanted brawn in construction and maintenance.

The rapid development of the locomotive boiler during the last twenty years also imposed the absolute necessity of securing labor-saving devices to supplant mere hand work, which, as time passed on, proved to be utterly inadequate. The inventive ingenuity of clever mechanicians arose to the occasion.

One of the most laborious of the old-time jobs was that of beading flues. Previous to the air-hammer this work was performed entirely by human strength. Even in the old days locomotive boilers frequently contained 300 or more tubes or flues. These, as now, were shouldered on the fire-box end, and pushed in through the front-tube plate-holes until the shoulder came up against the fire-box tube-sheet.

This allowed some 5-16 or ⅜ of an inch of tube to project beyond the tube-sheet into the fire box. It had to be turned over in the form of a bead. In order to bring this about with the primitive appliances of the day, it became necessary to pound this end with a short-handled hammer almost as heavy as a small sledge, some twenty-five blows probably being required for each tube.

Finished 371 Flues in a Day.

The edge, being thus roughly turned over, was afterward finished by a hand-beading tool which produced a smooth round contour. Naturally, when performed under such difficulties, and at the expense of so much bodily exertion, this work proceeded slowly.

Several days were frequently required to set the flues in the fire-box end alone, and no general foreman or master mechanic counted on such a job until told that it was finished

The air-hammer, however, revolutionized all this. By its use records have been made in flue application which are little short of marvelous. It is claimed that 371 flues have been rolled and beaded in a ten-hour working day. An authentic record exists of 350 in the same time.

The hammer, which closely resembles a large revolver, is driven by compressed air from the line with which all modern shops are now equipped. Its socket contains the proper tool required for the job. All that is necessary is to put the tool in contact with the work, turn on the air, and the hammer does the rest.

By changing the tools in the socket, practically all of the old-time manual operations can be performed mechanically. For instance, the hammer will not only bead flues, but it will calk seams, head up rivets and stays, and make a much cleaner chipped surface than an expert could do with a hammer and chisel.

Scarcely secondary in importance is the air-drill, which has practically driven the "old man" and ratchet of blessed memory into oblivion. If the pressure on the shop-line is adequate, this air-motor will drive a drill up to 1¼ inches in diameter as fast as you care to run it, and with a good, stiff feed in the bargain.

Eliminates Arduous Manual Labor.

If intelligently used it is capable of drilling a hole through more defective stay-bolts in one hour, for the purpose of removal, than could be chipped out in a day

These two appliances have eliminated seventy-five per cent of the labor formerly associated with the boilermaker's trade, and go far to explain why a much more superior class of apprentices now present themselves for admission to its ranks. With the hard work eradicated, opportunity is presented for night study, either at home or in the apprentice schools which are maintained by the majority of the large roads. Promotion is almost assured when the theoretical end of the trade has been absorbed.

Twenty years ago an apprentice boilermaker had rather a hard row to hoe. There was no systematic attempt on the part of his company to give him the necessary instruction to result in the development of a good mechanic. He was obliged to pick it up himself. This was long before schools of instruction were even thought of, and the boy depended solely for the secrets of the trade on the good-will or interest of the boilermaker with whom he worked.

To contrast the past with the present, a word in connection with the system as now conducted by the larger roads for

training apprentices may be of interest. For this example the Erie Railroad has been selected, the writer being familiar, from actual experience, with its system.

In the establishment of apprentice schools at its different shops the Erie had for its primary object, not the making of mechanical engineers from shop workmen, but the making of first-class skilled mechanics to recruit the shop forces with men trained and educated in Erie standards and methods.

Apprentices Thoroughly Instructed.

Apprentices seeking employment with the Erie must be not less than 16 nor more than 21 years old, and have good general health. Preference, as is the custom on all other roads, is given to the sons of employees. Employment is on probation. If at the end of three months the apprentice does not develop a capacity to learn the class of work to which he is assigned, the understanding is that he will be relieved from the service.

At the expiration of three months, the trial period, if the applicant has been attentive and gives promise of becoming a good workman, with the ability to successfully handle the work in the school, he will be regarded as a regular apprentice, entitled to all the advantages of apprentices in his class as set forth in the rules and regulations of the company governing apprenticeship training.

Instruction in the trades that are taught comprises quite an elaborate technical course; or, if not exactly elaborate, one sufficient to implant thoroughly the theory on which the various practical operations are based.

These schools, which are free to apprentices in all departments, and are in charge of competent instructors, are open from September 1 to June 30, inclusive. Each apprentice is required to attend four hours a week; two hours on two different days, for which time he is paid at his regular hourly shop rate.

The instruction covers the fundamental rules of arithmetic—common and decimal fractions, proportion, simple problems in interest, tables and weights, the elementary principles of plain and solid geometry, mechanical drawing, practical and theoretical mechanics, and instruction in Erie standards, as well as lessons on the successful and economical operation of those standards.

The systematic practical course, however, which was sadly lacking in the past, probably constitutes the most interesting feature in this commendable move to train pupils for positions of responsibility. To this end practical instruction is given the apprentices by shop instructors, who are held responsible for teaching them the best methods for using machine and bench tools.

The course of the apprentice boilermaker will illustrate the thoroughness. Its value is apparent, because a boy is not allowed to languish throughout his entire apprenticeship on one class of work. This was one of the mistakes of the years gone by, and was largely the fault of the foreman. If an apprentice was "good" on a certain job or machine, the foreman would likely keep him there from purely selfish motives

None of this is possible now. Proper application on the part of the pupil insures that he will be taught everything pertaining to the trade which he has elected to learn.

A Course in Boilermaking.

The following is the practical course in boilermaking which has been adopted by the Erie Railroad. With a few modifications, it is the same as that given by the New York Central, Santa Fe, and other roads which have adopted the apprentice-training system. It is a four-year course, three being thus divided:

Heating rivets and helping at light work on punch and shear, scaling boilers, etc..	4 months.
Ash-pan and netting work, also as much miscellaneous sheet-iron work as possible	6 months.
New fire-box work, reaming and tapping stay-bolt holes, running in, setting, and cutting off stay-bolts, etc	4 months
Helping to scarf, roll, fit, shear, apply rivets and calk new fire-box or new sheets	6 months
Setting flues.....	3 months
Helping on flange fire.....	3 months
Working with boilermaker on general work, such as flanging, riveting, applying new sheets, bracing, and stay-bolt work.....	10 months.
Total . .	3 years

The fourth year of the apprenticeship is spent principally in the back shop, on patches, half-side sheets, door-sheets, back and front flue-sheets, smoke-box extensions, liners in smoke-box, and general work in this department.

One apprentice is always selected from those in the fourth-year class for instruction in the important detail of laying out work from blue-prints. Formerly blue-prints were never shown. They were regarded as one of the greatest secrets of the trade.

Wonders Worked by "Layer Out."

The "layer out" in the boiler shop and the valve-setter in the roundhouse, or the erecting department, were regarded with respect amounting to awe, not only by apprentices, but journeymen as well. Modern ideas and advanced methods, however, have long since shattered this prestige, and their mysterious work can now be as readily performed by any clever young apprentice at the conclusion of the fourth year in the two respective trades.

From what has been told here, it may be readily appreciated that, on receipt of his certificate, the boilermaker apprentice is well equipped to combat any problem which the future may have in store for him.

If he remains in the home shop his success should be assured, as he has the advantage of familiarity with its methods and standards, thereby rendering his work much easier.

The idea, of course, in establishing these schools was to train young men for the future service of the company.

It requires a heavy investment of money; and it is expected that in return for the exceptional advantages afforded them while learning the trade the graduates will remain, but there is nothing in the agreement to compel them to do so But the companies do not lose many on the completion of apprenticeships. It is not believed that the Erie has been affected in this manner more than ten per cent. Several, after wandering around for a while, have applied for re-employment.

Boilermaking may be divided into two branches, new work and repair work. New work comprises laying out sheets for shearing, punching, or drilling; also flanging and assembling the various parts into the completed structure. Repair work is the maintenance of these parts after having been placed in service.

In the department of new work the "layer out" is generally the best paid of the clan. He may receive from $3.50 to $5.50 a day, and is practically the only one in the entire boiler shop whose work must not embody the slightest error. This is because the sheet laid out first from the blue-prints usually serves as a templet for the reproduction of all subsequent similar sheets in that particular order.

A mistake made in the first would likely be repeated in the remaining ones, with the unpleasant contingency that all might be rejected.

It is a formidable job to lay out a big boiler side-sheet; and when several engines are included in the contract, considerable time is allowed to the man who does it.

Five hundred holes may have to be located on a single sheet, not to mention the various indications for flange-bends and what not

The importance of the operation naturally results in the sheet being checked again and again both before and after drilling, and when finally passed it may be presumed to be as free from error as human scrutiny can make it.

The operation of flanging, in which the edges of sheets are turned at right angles for attachment to connecting sheets, was formerly performed entirely by hand, the sheet being heated and laid on a cast-iron block, or form, which was carefully made to represent its finished shape. The edges of the sheet were then fitted to this form by knocking them down with sledges.

Turning the Flange.

The man in charge of this work was known as a "flange turner." He superintended the heating of the new sheet in the furnace. Under his immediate direction was a gang of "strikers" who fashioned it over the block. This was, and is yet, another well-paid job. Without the exercise of great care a sheet can be readily spoiled in the rough treatment to which it must necessarily be subject-

ed during the process of heating and flanging.

In all modern shops, however, flanging on the block has been supplanted by the flange press. This formidable machine, sometimes of 100,000 pounds capacity, is operated by water power. Its plunger carries the die against the heated sheet, flanging it perfectly in an instant without the severe strain imposed by the former method.

When the parts are in readiness the boiler is set up, under the direction of the foreman or assistant foreman of the shop, by means of temporary fastenings, after which it is turned over to the riveters, stay bolt, and flue-men for final completion.

As a rule, new work, such as outlined above, carries the greatest appeal to the all around boilermaker. If the system in vogue in the shop is adequate, it passes along very pleasantly; it has the advantage of being comparatively clean. When there are a great many boilers to be built of identical dimensions, sometimes phenomenal speed records can be made. This is a point to be considered seriously by the mechanic, as practically all large shops now pay on a piecework basis, and when there is a rush of work it is frequently possible for a man to double his day rate.

Rough-and-Tumble of Repair Work.

New work, in many shops, also consists in building ash pans, although in some quarters it is taken from the boilermakers altogether and called sheet-iron work. The same also applies to the front-end draft appliances, the netting, and spark-pipe, but they really belong to the trade, and the training schools include them in their course of instruction in boiler-making.

The real rough-and-tumble of the boilermaker's life is found in running repair work on engines just arrived from the road, which must receive the usual routine attention before being returned to service.

We all know that the roundhouse machinist gets it much harder than his pal of the back shop, and the same applies to boiler-making. The boilermaker, however, has a far more strenuous and disagreeable time than the machinist ever dreamed of—one which requires the patience of Job and the constitution of a salamander

A salamander, in fact, could scarcely live in some of the fire-boxes and front-ends which roundhouse boilermakers enter daily. Despite the writer's long experience in charge of railroad terminals, he has never yet ceased to wonder how human endurance can stand the strain imposed by this arduous "hot work."

Ordinarily, the fire is not drawn, or dumped, in a locomotive unless a wash-out of the boiler is necessary. This may range anywhere from two to thirty day intervals, consequently "hot work" means that all running repairs to boilers must be performed in a temperature but little less than would be in evidence if the machine was out with its train. Taking the fire out and leaving the grates clean eliminates the active combustion, but the heat is not lost by any means.

Calking Flues in Hot Fire-Box.

The most prominent illustration in the line of "hot work" is calking flues. No matter what section of the country may be visited, New England or Arizona, it will be found that leakage of these important accessories to a boiler is inseparable from locomotive operation. They are liable to leak once a month in Boston, and in Arizona twice a day, provided the engine can make two trips within the twenty-four-hour period.

Leaky flues means low steam, inefficiency on the road, and every chance for an engine failure, so the roundhouse boilermaker's work is largely confined to correcting this trouble in its incipiency; in other words, by as careful and conscientious a job as will insure the locomotive making a round trip without the possibility of "falling down."

Flues leak from many causes: poor firing, roundhouse or fire track neglect, bad water, and other troubles. Whatever the cause may be, however, it is up to the roundhouse boilermaker to apply the remedy. The laconic report returned by an engineer, simply, "Flues leaking," and it is not an index to the magnitude of the job.

Sometimes only ten out of a possible 400 are at fault, and then again the entire set may be "weeping." No boiler-

maker knows until he enters the fire-box just what he has to do. The job may taken twenty minutes or three hours.

When a locomotive with leaking flues arrives on the ash-pit the fire is promptly dumped, and she is taken into the house under her own steam as soon thereafter as possible. Probably when she arrives over her designated pit there is still 120 pounds on the steam-gage—and the fire-box is still hot

Toiled in Scorching Temperature.

Now, if this particular engine isn't required to "go back" immediately, or has a ten-hour or more lay-over, the boiler is thoroughly cool before the boilermaker enters the fire-box. Then the work can be done in comfort.

Then the fire-box temperature will have been lowered to a point making it bearable; but how about the time when power is in urgent demand, and the train-despatcher is shouting for the engine almost before it crosses the turntable? This is where the salamander end of the game comes in, because the flues must be calked, and that is up to the boilermaker.

Under such conditions the writer has seen a loyal man go into a fire-box with his flue-rolls and beading tool at a temperature which would fry eggs. He was not ordered in, as the agreement entered into between the association of which organized boilermakers are members and the company stipulates, in one clause, that the boiler shall be cooled down before any work is done; but it has also been the writer's experience that, agreements to the contrary, these faithful men, with their company's interests truly at heart, will make any sacrifice to keep the stuff moving.

Fifteen Minutes of Unbearable Heat.

It is well recalled on one occasion that a Bay State Limited engine, arriving at Boston at 3 P.M. with leaky flues, was scheduled to return to New Haven on the Merchants' Limited which left the South Station at five o'clock. Some fifteen flues were leaking badly when the locomotive arrived at South Boston. The men were in despair, because we knew that time did not permit us to live up to the agreement and still preserve the schedule.

While vainly searching for an engine to take the place of the disabled one, a certain boilermaker volunteered to enter that inferno and fix her up. How he did it those who witnessed the job cannot describe; but the fact remains that he entered that fire-box from which the fire had just been removed, remained in that unbearable temperature for at least fifteen minutes, and emerged with the flues calked and the day saved.

The new fire was put in at 4.20 P.M., and at 4.45 she was backing over to Boston to take her train.

In that brief period of twenty-five minutes he rolled each of those fifteen leaking flues, and, in addition, ran the air-hammer containing the proper tool over the head of every one. His only reward was the consciousness of duty well performed and the gratification that the engine arrived on time at New Haven with her train

Of course, this is an extreme case, but it shows what may be expected in connection with "hot work" which is performed under practically prohibitive conditions

Federal Inspection Every Month.

"Hot work" also means the inspection of stay bolts, and there may be close to a thousand in a big boiler. As often as the law directs—at least once in thirty days—each one of these bolts must be rapped with a light hammer to determine whether or not it is fractured.

Stay-bolts and crown-stays unite the fire-box to the outer boiler-shell. A failure of several in the same locality generally indicates a dangerous weakness which is liable to result in disaster.

Some years ago the Public Service Commission of the Second District of the State of New York was empowered with jurisdiction over this important detail, and now, through the Federal Boiler Inspection Law, the government has made it universal

Inspections, which are made monthly, have to be sworn to by the inspector before a notary public. Any falsification on the part of the boilermaker charged with the inspection is penalized by dismissal from the service of his own com-

pany, and with the possibility of criminal prosecution by either State or government authorities.

The hammer test, so-called, is generally employed for the detection of broken bolts. It consists in simply rapping the head of every bolt from either the outside or the fire-box side, the condition of the stay being determined by the sound. There is a sharp ring when the bolt is good, and a dead or metallic sound when it is fractured.

The proficiency attained by some of these inspectors is astonishing. As an instance, I will mention the case of an old boiler on the New Haven road which was about to be cut up, as it had passed its period of usefulness. Previous thereto it was offered to the various inspectors of the road as a test for broken stay-bolts.

Some fifteen men, detailed by the master mechanics of the shops on the system, attended the inquest on the old boiler, and each rapped the stay-bolts, indicating those thought to be broken on a specially prepared chart.

When the boiler was finally dismembered it was found that twenty-eight bolts were fractured, and of these one man detected, simply by the hammer test, twenty-seven. Of the fifteen inspectors, the poorest showing made was in locating twenty broken stays.

The hammer test, intelligently applied, is conclusive.

Some boilermakers are gifted in this particular line. With very little practise they can locate defective bolts, while others never learn. The former are invariably selected from the ranks, and are designated as boiler inspectors.

It is usually the practise in roundhouses to work the boilermakers week about on "hot" and on "cold work."

"Cold work" is applying patches, putting in stay-bolts, or any work not requiring a man to enter a fire-box. If the men are equally qualified, this becomes an ideal arrangement. It does away with partiality on the part of the foreman, and forbids the imputation that a certain boilermaker is always kept on the disagreeable end of the work.

An examination of the really artistic work produced in the line of patches, half-side sheets, etc., would readily convince the skeptical that this is a skilled trade. The writer has seen new back-flue sheets so perfectly applied that calking of the seams was unnecessary when the water test was applied.

Of course the work is hard, notwithstanding the labor-saving devices referred to, but its importance finally has been recognized.

Promotion from the ranks is usually first to assistant foreman, at a salary of about $100 per month; thence to foreman, at an average monthly rate of $140. There is also a chance, if a man displays particular aptitude, to secure the position of general boilermaker foreman, with jurisdiction over the boilers on the entire system.

This is comparatively a new office, but its value is generally recognized, and it is fast being incorporated in the mechanical organization of all railroads. The duties of the general boilermaker foreman, or general boiler inspector, call for a regular round of the various shops and inquiry into the prevailing shop methods relating to boiler work.

One feature of particular value in connection with the job is that the wide-awake incumbent can carry ideas from one shop to another. For instance, if one shop has unearthed some jig or method which greatly simplifies and cheapens a certain operation, the general boilermaker foreman, while on his rounds, can install the same wherever he visits. This results in uniformity in shop practises, and tends toward a standardization of pay for that piece of work.

If an accident to a boiler occurs, he must hasten to the scene, and forward a complete and unbiased report to his superior. It is a position wherein a man, to do full justice to his company and himself, must take the initiative. Those who do so need have little fear of future success.

When a bad habit gives you the board, be sure to reverse the will-power and stop.

PENNSY VET WAS EMPEROR'S AID.

Joseph Ury Crawford, Soldier and Construction Engineer, Retires After Being Decorated With Japanese Royal Orders.

JOSEPH URY CRAWFORD, consulting engineer of the Pennsylvania Railroad, and one of the most prominent officers in its service, having reached the age of seventy, retired on a pension from active work in September last. Aside from a war record, Colonel Crawford has attained fame as an engineer, both at home and abroad, and during his long period of service was engaged in many important engineering projects

Mr. Crawford was born at Ury Farm, Philadelphia, on August 25, 1842, and educated at John W. Faries's school, from which he went to the University of Pennsylvania, in the class of 1862

At the outbreak of the Civil War, Mr. Crawford enlisted in the 17th Pennsylvania Regiment (Washington Grays, of Philadelphia, when the Confederate forces first fired on Fort Sumter, on April 14, 1861. He was commissioned second lieutenant, 6th New Jersey Volunteers, in October, 1861; promoted at Williamsburg to first lieutenant, and to captain at Seven Pines, on June 1, 1862. He was honorably mentioned in brigade reports of the Pope campaign, in the autumn of 862, and detailed to staff duty in December, 1862. He was also honorably mentioned in division and brigade reports of the battle of Gettysburg

JOSEPH URY CRAWFORD, VETERAN SOLDIER AND CONSTRUCTION ENGINEER ON THE PENNSYLVANIA WHO HAS RETIRED ON A PENSION AFTER A LONG SERVICE DISTINGUISHED BY RECOGNITION OF JAPAN'S LATE EMPEROR MUTSUHITO

From 1865 to 1870, Mr. Crawford was engaged in surveying across the Alleghany Mountains for the Atlantic and Great Western Railroad Company, and in New York and New England on surveys and railway construction. He entered the service of the Pennsylvania Railroad as senior assistant engineer of the Alexandria and Fredericksburg Railroad during 1871 and 1872

He was principal assistant engineer, and afterward engineer of the California division of the Texas and Pacific Railroad, under Colonel Thomas A Scott, and, on his recommendation, Mr. Crawford was appointed consulting engineer of the Japanese government in 1878, at the close of which engagement he was decorated by the Emperor of Japan with the Order of the Rising Sun.

After his return to America, Mr. Crawford was employed by the late Jay Gould to make transcontinental examinations and surveys between the Pacific coast and Salt Lake City, as well as in the States of Wyoming and Nebraska.

In the fall of 1882 Mr. Crawford again entered the service of the Pennsylvania Railroad Company as chief engineer of the Pennsylvania Schuylkill Valley Railroad, and he built the Piedmont and Cumberland Railroad in 1886 and 1887

THE LEADERS OF THE GREAT

SAMUEL J PEGG, GRAND SECRETARY-TREASURER OF THE INTERNATIONAL BROTHERHOOD OF MAINTENANCE-OF-WAY EMPLOYEES

MR PEGG not only directs the affairs of his combined offices, but is the editor and manager of the official organ, *The Advance Advocate*. In 1885, when the order was known as the Brotherhood of Railroad Section Foremen, Mr Pegg who had previously been grand secretary treasurer, was chosen as the grand chief foreman. In 1891 he urged that his order amalgamate with the Brotherhood of Railway Trackmen, an organization then existing in the South. A joint convention was held in the following year. Mr Pegg and Mr J T Wilson were the candidates for chief. Strangely neither was elected, and they agreed to draw lots for it. Mr. Wilson drew the longer straw. Mr Pegg has always played a very prominent part in the affairs of his brotherhood.

RAILWAY ORDERS OF AMERICA.

A. B. LOWE, GRAND PRESIDENT OF THE INTERNATIONAL BROTHERHOOD OF MAINTENANCE OF-WAY EMPLOYEES.

MR LOWE was born in Banff, Scotland, November 11, 1845, lived for a number of years in Ireland, emigrated to Canada, and when seventeen years old, began his railroad career as a section-hand on the Brockville and Ottawa Railway. For a few years he abandoned track work for construction, and had charge of track balasting from Rome to Syracuse when the New York Central four tracked its main line. In 1875 he returned to Canada, where he became section and extra gang foreman on the eastern division of the Canadian Pacific. The work brought him into intimate touch with men, and taught him the lessons that have enabled him to so successfully administer the affairs of a remarkable organization of railroad workers. He became grand president of the order in 1907.

THE ROMANCE OF AMERICAN RAILROADS.

BY W. S. WRIGHT.

(PART IV.)

DAVID MATTHEW, foreman of the West Point Foundry, had charge of the men who fitted up the "Stourbridge Lion" when she arrived from England, and the fitting up of the "Best Friend," the first locomotive ever built in America for actual service on a railroad. Writing about railroading at that time, Mr Matthew said, some years later:

> The first American built locomotive for actual service on a railroad was called the "Best Friend of Charleston" I had charge of the men fitting up this engine This was in 1830, shortly after the "Stourbridge Lion" had been tried in our yard, and some modifications were made The "Best Friend of Charleston" was contracted for by E. L. Miller, of Charleston. She was a four-wheel engine, and all four wheels were drivers
>
> Two inclined cylinders at an angle worked down on a double crank inside of the frame. The wheels were outside of the frame, each wheel connecting with outside rods. The wheels had iron hubs, wooden spokes, iron tires, and iron web and pins to connect with the outside rods
>
> The boiler was a vertical one It was formed like an old-fashioned porter-bottle, the furnace at the bottom was surrounded with water and was filled inside with what we called teats, running out from the sides and top, with alternate stays to support the crown of the furnace; the smoke and gas passing out through the sides at several points into an outside jacket which had the chimney on it.
>
> The boiler sat in the center of the four wheels, with the connecting rods running by it to the crank-shaft. The cylinders were about six inches in the bore, and sixteen inches stroke. The wheels were about four and a half feet in diameter The whole machine weighed about four and a half tons It was shipped to Charleston, South Carolina, in the fall of 1830, for the Charleston and Hamburg Railroad, and was put on that road during the winter
>
> It was the first locomotive built in America. It was exhibited at our shop under steam for some time and was visited by many. She was shipped to Charleston on board of the ship Niagara, in October, 1830.

Professor Samuel Henry Dickson of the Jefferson Medical College of Philadelphia, described his visit to the West Point Foundry in 1830. At this time the "Best Friend of Charleston" was just completed and about to be shipped to Charleston.

Professor Dickson recorded his recollection of the "Best Friend" as follows:

> Being North in the summer of 1830, I was requested by the board of directors of the Charleston and Hamburg Railroad (the South Carolina Railroad), of which I was a member, to visit the foundry of Gouverneur Kemble, to look at a locomotive-engine which he was building for our road, and report as to its general appearance and the prospect of its completion at the appointed time.
>
> Our contract had been made with E. L. Miller, who engaged with Mr Kemble to build the machine Mr Miller accompanied me to the workshop, where I saw with intense interest and great satisfaction, not unmixed with some pride, too, the first locomotive constructed in this country
>
> Never having seen a locomotive, and being neither engineer nor mechanic, I could not presume to pronounce on its merits and was as curious and anxious

about the result of our experiment as any one interested

But I had read and heard a good deal on the subject and did not hesitate to recommend the prompt acceptance of the engine from the contractor and to congratulate my fellow directors on its promise of decided utility and advantage to our great enterprise

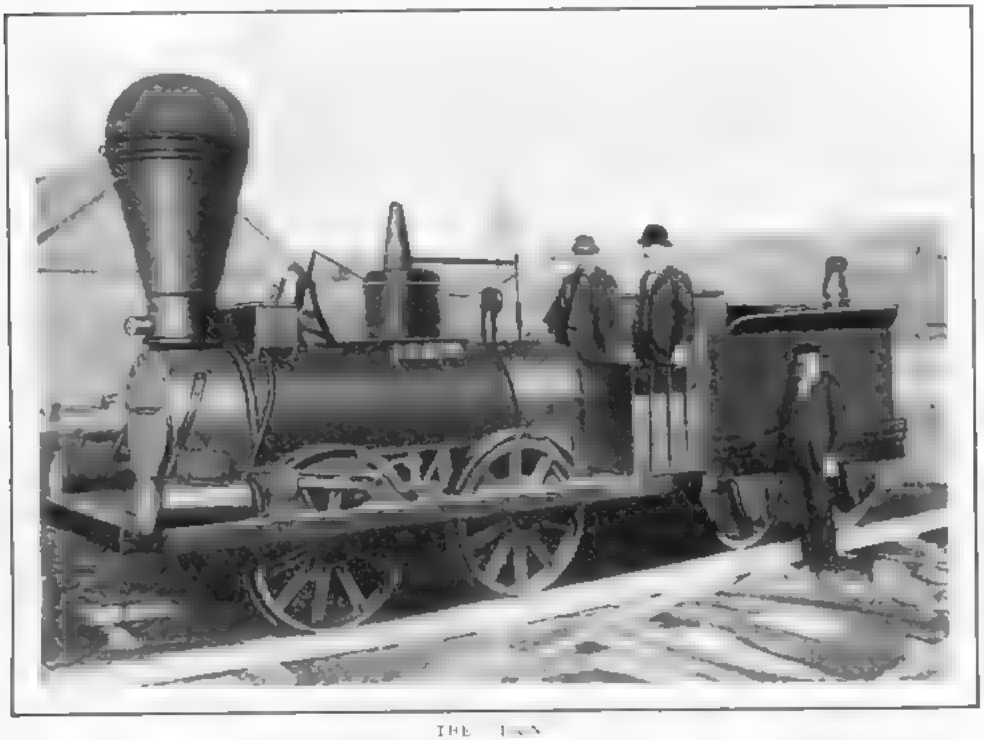
Mr Miller named it, I think, the "Best Friend," and it was forwarded to Charleston late that fall or early in the winter, when it was at once put on the road. It did not disappoint our hopes, but proved in capacity and serviceable qualities all that we had expected. It was run long and successfully under the charge of Mr Darrell, one of our young machinists

I am under the impression that it was one day blown up through the carelessness of a negro fireman, that it was soon repaired and replaced upon the road. Of its ultimate fate I am not certain, but believe that, after having attained a ripe old age, in process of time it finally wore out and was thrown aside, the common destiny of man and all his works

William H Brown, the historian, examined the order-book at the West Point Company's Foundry, at Cold Spring, Putnam County, on the Hudson River, for some reminiscences of the "Best Friend," but all he could find was the following order from the New York office, dated April 6, 1830:

> Two cylinders, see pattern locomotive-engine, nozzles for exhaust cast right and left

The above shows that work on the engine was begun, as David Matthews states, in the spring of 1830.

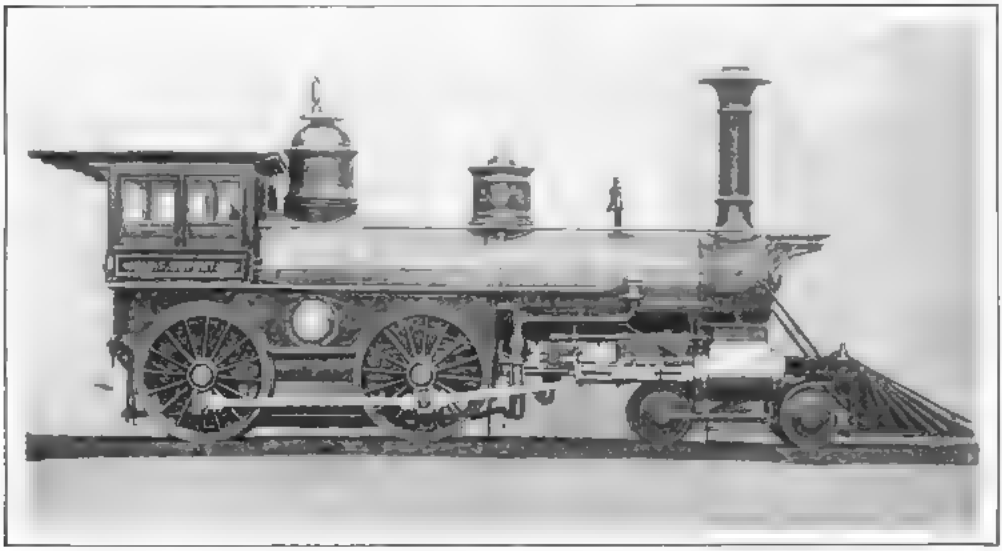


THE "LION"

The "Lion" was one of the first locomotives built by the famous Hinckley and Drury Company of Boston. It was built about 1833 and was sent to the Whitneyville and Machiasport Railroad, a scrap line, about eight miles long, used for the transportation of lumber. From the beginning this road was free to anybody who chose to ride upon it and take his own risk. The weight of the "Lion" with tender was about nine tons

As no machinist came with the locomotive, the superintendent of the Charleston and Hamburg Railroad applied to Thomas Dotterer of the firm of Dotterer & Eason, machinists and engineers, to put the machine together for the road. Julius D. Petsch, foreman in the D and H. workshops, was selected to superintend this duty. Mr. Petsch selected as assistant Nicholas W. Darrell, a young man who had just served his apprenticeship in their shops.

Petsch and Darrell immediately set



THE "S. F. DUPONT."

The "S. F. Dupont" was built for the Philadelphia, Wilmington and Baltimore Railroad by the Baldwin Locomotive Company in 1862. It was equipped with a Dimfels boiler. This boiler had tubes of small diameter which opened through the crown sheet of the fire-box and, being bowed, extended to and communicated with a water space at the fire-box end of the boiler. Although thus traversed by tubes, the whole length of the barrel of the boiler served as a combustion chamber, the outlet for the products of combustion being at the bottom of the smoke-box.

about fitting up the "Best Friend" for the road, and so energetically did they work that all was ready in a few days. Before the first of November several short experimental trials were made. On November 2, with Mr. Darrell in charge, the official trial-trip was made.

The result of this trial-trip was described by Horatio Allen, in the Charleston *Courier*, November 3, 1830:

> The public will regret to learn that an accident has happened to a pair of the wheels of the locomotive engine lately put upon the railroad. To prevent any misunderstanding or exaggeration, it is proper to communicate the facts. The change of direction which takes place when a carriage enters a curved part of a road is effected by the action of the flange which is attached to the rim against the iron rail.
>
> A lateral strain is then brought to act on the spokes of the wheel, and in this present instance they have proved too weak to resist it, and from this circumstance the accident originated. The spokes were discovered to spring, and fears were entertained by Mr. Miller, shortly after he commenced running his engine. Yesterday he experimented with it for this especial purpose, and after having proceeded to the extremity of the road, and almost completed his return, during which time the operation of the engine was in the highest degree satisfactory, the forward wheel was sprung inward, so much so as to leave the rail entirely; and the engine, after proceeding about twenty feet, was stopped with both the front wheels off the rail and some of the spokes much injured.
>
> It is as singular as satisfactory that no other part of the frame, machinery, or boiler exhibited the least derangement, affording the most decisive proof of the correctness of the proportions and the excellence of the work. It is but justice to state that the wheels were made after the English wheels, the most approved until the construction of the wrought iron ones. A short time will be required to replace the wheels, when the engine will again be put in motion.
>
> No personal injury happened to any of the individuals, either on the passenger-car or engine.

On the 14th and 15th of December, 1830, the engine was tried again, and proved her force and efficiency to be double that contracted for, running at the rate of sixteen to twenty-one miles an hour with forty to fifty passengers in some four or five cars, and, without the cars, thirty to thirty-five miles an hour.

"Jockey of York," a humorous sporting writer of that period, gives an account of a trip on Christmas Day in the Charleston *Courier*, December 29, 1830:

> Our distant friends no doubt are desirous to know the result of our Christ-

mas sports. The celebration season was altogether novel and interesting. The iron horse, "Best Friend," was entered for the purse, about a fortnight since, to "run against time." The "heat" was that he should run ten miles an hour, carrying three times his own weight.

He was trained every day preparatory to the great trial of speed. Doubts were at first entertained as to "his wind," when everybody acknowledged he had sufficient bottom." The "Best Friend" is out of a horse bred by Messrs. Watt & Bolton, and of the same breed as the "Novelty" and "Rocket" which contended for the purse of £500 at the late Liverpool and Manchester races. By crossing the breed with a Columbian sire he has eclipsed his progenitors upon the European, and stands unrivaled upon the American turf. The knowing ones have already hinted that his dam was "half salamander, half alligator," for he eats fire, breathes steam, and feeds upon light wood.

All doubts, however, of his being "short-winded" have been dissipated, and it is now confidently believed that he can run one hundred miles without "flagging," for, like Pat, after the foot-race at Donnybrook Fair, when being questioned if he was "out of breath," replied

"No, faith, I'm only likely to be troubled with too much of it."

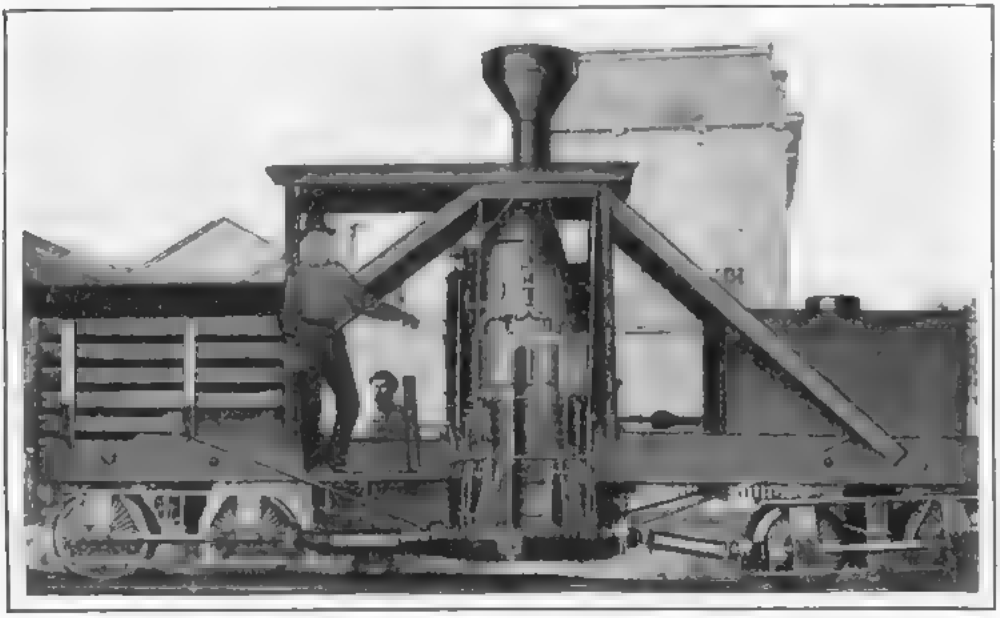
But I am the "odd fellow" of the one hundred and forty-one persons who were drawn, or rather whisked, through the air by the iron horse or locomotive-engine, on Christmas Day,

Which sped through the air like a meteor swift,
While the crowds from around it did fearfully drift
To the right and the left, as it passed

We flew on the wings of the wind at the varied speed of fifteen to twenty-five miles an hour, annihilating time and space and, like the renowned John Gilpin, "leaving all the world behind." A venerable friend of mine, seventy-five years of age, gravely remarked he thought it was passing through life rather too quick, as the journey at least was a very short one.

"Very true, my good sir," said I. "We cannot, however, just now take time for those sage reflections on matters and things in general so necessary to our mental and moral improvement."

It was nineteen minutes, five and one-fourth seconds since we started, and we discovered ourselves beyond the forks of the State and Dorchester roads. Somebody exclaimed the engine was waltzing. I looked around, and 'tis a fact, notwithstanding the apparent absence of every moving principle of grace and agility, it turned round as nimbly as a miss of sixteen; but I swear by the spectacles I shall one day or other wear, that either the road or the engine turned round like a top in proof of which I appeal to my own



FIRST SHAY-GEARED LOCOMOTIVE

The Shay geared locomotive is certainly an interesting machine. All its wheels are used for traction. As will be seen in this illustration of the earliest form of Shay-gear locomotive the engines are of the vertical kind and drive a shaft which runs the entire length of the locomotive and tank and is connected with the driving wheels and wheels of the tender-trucks by bevel spur-gears of cast steel. The cylinders are attached to the boiler by heavy steel castings and are also attached to the frames.

pumps—if it did not afterward chassé to the left and remain there until the three cars led off a country-dance before it.

Never did reviewing general present a more warlike front to troops passing on line of march than did this same knight errant, "clad in his iron-bound armor." As each car came in front, it gave us three whiffs of steam in acknowledgment that the compliment to our company was felt and appreciated. Never were the three ruffles of the drum more gratifying to my feelings when military ardor "fired my breast."

On our return, it again headed the column. We came to Sans-Souci in quick and double-quick time. Here we stopped to take up a recruiting-party, then darted forth like a live rocket, scattering sparks and flames—on either side—passed over three salt-water creeks, hop, step, and jump, and landed us all safe at the Lines before any of us had time to determine whether or not it was prudent to be scared. It beats the Dumb Chess-Player all hollow.

In January, 1831, the first anniversary of the C. and H. Railroad was celebrated. Notice having been given, several hundred people assembled in the morning at the company's building in Line Street. The weather the day and night previous had been stormy, and the morning was cold and cloudy. Anticipating a postponement of the ceremonies, the "Best Friend" had been taken to pieces for cleaning, but with the assembling of the company she was put in order.

The first trip was performed with two pleasure-cars and a small "carriage" attached. On the latter was a detachment of United States troops and a field piece.

When the train was ready for this ceremonial trip it was found necessary to tighten the packing in the locomotive's cylinders, which occasioned some little delay. At about one o'clock she started with three cars attached, on which were one hundred passengers. At two o'clock a Federal salute was fired by the detachment of troops stationed upon the remains of the fortification erected during the Revolution. At four o'clock the company commenced returning, and were all safely landed at Line Street before six o'clock.

The "Best Friend" continued to do the necessary work of the road, hauling materials, workmen, ballast, lumber, etc., used in the construction, during all of which time she was in charge of Nicholas W. Darrell.

On Friday, June 17, 1831, the boiler of the "Best Friend" exploded. This was the first explosion of a locomotive boiler in America.

On this historic morn, the "Best Friend" started out to meet the lumber-cars at the Forks of the Road. While on the turn-table the steam was allowed to accumulate by the negligence of the fireman, a negro, who, leaning against the safety-valve, prevented the surplus steam from escaping.

The boiler burst and injured Mr. Darrell and two negroes. Mr. Darrell was badly scalded. The boiler was thrown twenty five feet. At the time of the accident, Engineer Darrell was helping to make up the train of lumber cars.

The wreck of the "Best Friend" was sent to the shops of Mr. Dotterer for repairs.

Railroad men of to-day will ask why the engineer, Mr. Darrell, wasn't on the engine and why he was helping to make up the train, leaving his engine in charge of his negro fireman.

At that early day, no such positions as conductors, flagmen, or brakemen had been instituted. The engineers of locomotives, like the drivers of the old fashioned stage-coaches, had to do their own "hitching up."

Previous to the explosion of the "Best Friend" an accident occurred at a switch.

"It originated," as was stated at the time, "in the wild derangement of the tongue, which guides the wheel through the turnout, by some ill-disposed person, and was rendered injurious to the car by the imprudent speed allowed by those who had the management of the engine—the tongue having been nailed to its proper position, but was made loose by removing the fastening, and was probably shaken from its place by the speed with which the engine and one car had preceded the one injured.

"Directions have been given to pass the turnout at moderate speed, and the attention of the person in charge to be constantly kept on the road in advance of the engine."

Because of this accident the C. and H. Railroad issued the following order:

Resolved, that in future not over twenty-five passengers be allowed to go on

each car That the locomotive shall not travel at a greater speed when there is attached

One car and passengers at fifteen miles an hour

Two cars and passengers at twelve miles an hour

Three cars and passengers at ten miles an hour

And that directions be given to that effect

The second locomotive for the C. and H. Railroad, and also the second built in this country, arrived at Charleston by the ship Lafayette on Monday, February 28, 1831. This engine was ordered from the West Point Foundry

It was constructed from plans sent by Horatio Allen, the chief engineer of the road. David Matthew described this locomotive as follows:

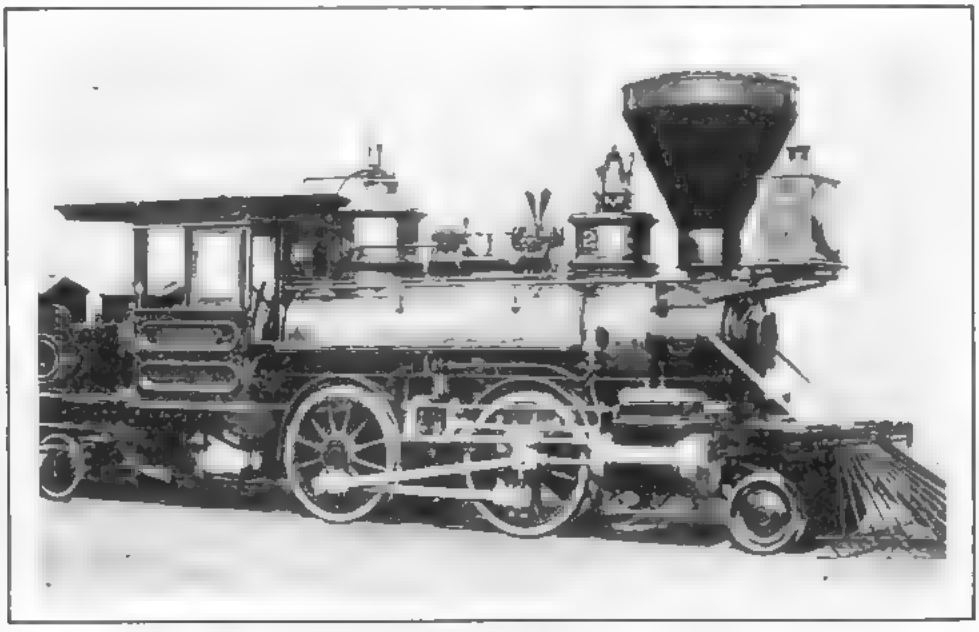
> American locomotive number two was called the "West Point." This engine was contracted for by Horatio Allen, and was commenced by me, David Matthew, in the fall of 1830, and completed and shipped to the Charleston and Hamburg Railroad about the middle of February, 1831. This locomotive had the same size of engine, frame, wheels, and cranks as the "Best Friend," but had a horizontal tubular boiler. The tubes were two and a half inches in diameter and about six feet long

On Saturday afternoon, March 5, 1831, the "West Point" had a speed trial with a "barrier" car and four cars for passengers. There were one hundred and seventeen passengers of which number fifty were ladies in the four cars Six bales of cotton were loaded on the barrier car, and the first two and three-fourths miles were completed in eleven minutes, when the train was stopped to oil the axles. The two and one-fourth miles to Dorchester road were completed in eight minutes.

Safety was insured by the introduction of a barrier car a car loaded with bales of cotton intended as a rampart of safety, so to speak, between the locomotive and passenger-cars.

The new locomotive worked admirably and the safety-valve being out of reach of any person but the engineer precluded the possibility of an accident such as befell the "Best Friend."

Tristram Tupper, president of the C and H. Railroad, in his "The History of the Road," said:

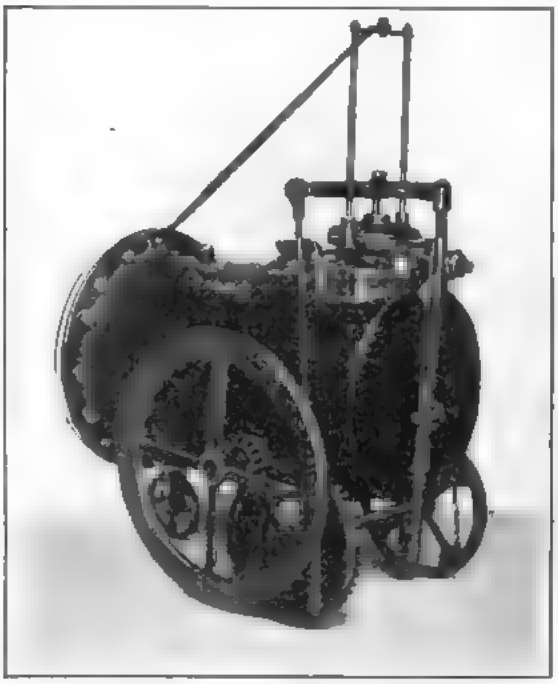


THE 'J W BOKER.'

A yard engine built by Baldwin about 1878. This type of locomotive was equipped with a fire engine, or steam pump, on top of the boiler and was popular in railroad yards or shops not furnished with fire apparatus

> The locomotive alone shall be used. The perfection of this power in its application to railroads is fast maturing, and will certainly reach, within the period of constructing our road, a degree of excellence which will render the application of animal power a gross abuse to the gifts of genius and science.

This was assuming a great deal when animal power was used for years afterward on American railroads.



RICHARD TREVETHICK'S FIRST ATTEMPT.

After experimenting for several years with a steam-carriage for common roads, Trevethick turned out the model shown in the photograph. It was not intended to run on rails, but it was the basis of his later designs. This engine was built in 1802, and is still preserved in the South Kensington Museum, London. Trevethick's first locomotive to run on rails was built in 1804.

When the Baltimore and Ohio Railroad was commenced, nearly a year before, from the lack of experience and under the advice of the best English engineers, the track was designed and constructed for horse power, and not until it had been built as far as Ellicott's Mills, a distance of thirteen miles, were locomotives considered.

The road was considered ruined for locomotives which at that time began to show some signs of advancement and improvement in England, and the B. and O. stockholders refused to advance another dollar toward its completion, when Peter Cooper's little locomotive, the "Tom Thumb," demonstrated the fact that although the road was really built for horse power, locomotives could be run upon it successfully.

But with the C. and H. directors there was no such doubt. At the first meeting of the board, the chief engineer of the road, Horatio Allen, insisted that the road should be built for locomotive power. This resolution was unanimously adopted, and was included in the contract with Mr. Miller to furnish a locomotive.

I have recorded so far in this history what are, perhaps, the exact facts regarding the beginnings of our American railways, but there shall be some dispute always as to the first locomotive and the first engineer. In the *Coachmaker's Journal*, one of the most influential publications in Pennsylvania eighty years ago, a Mr. Haskell claimed that the first really effective locomotive in America was built in Philadelphia.

According to Mr. Haskell this locomotive was built from designs by Rufus Tyler, a brother-in-law of Mathias Baldwin, founder of the Baldwin Locomotive Works.

Tyler and Baldwin had formed a copartnership and entered into business at the corner of Sixth and Miner Streets, Philadelphia, where the plans and patterns were made and the building of the iron horse commenced. In consequence of a misunderstanding, the partnership was dissolved, and Mr. Baldwin continued the business, removing to a shop in Lodge Alley, where the engine was completed.

Mr. Tyler, at that time, was considered the best mechanic in America. The wheels of his engine were made of wood, with broad rims and thick tires, the flange being bolted on the side. It was called "Old Ironsides," and was built in 1832.

She was first put in motion on the Germantown and Morristown Railroad at its depot, Ninth and Greene Streets. She ran a mile an hour, and was considered the wonder of the day.

During the trial it was ascertained that the wheels were too light to draw the tender. To obviate this difficulty the tender was placed in front of the engine.

Baldwin, Tyler and Haskell, in order to start the engine, pushed it until it obtained some speed, when all jumped aboard.

The weight of the men kept the wheels from slipping on the track.

The boiler being too small for the engine, steam was generated only fast enough to keep the engine in motion a short time, so that the three men were compelled to alternately push and ride until the Germantown depot was finally reached.

"At four o'clock," wrote Mr. Haskell, describing the trial trip, "we started on our return to Philadelphia, alternately riding and pushing in the same manner we had come. On arriving at a turn on the road, at the up-grade, the engine suddenly stopped, when, upon examination, it was found that the connecting pipe between the water-tank and the boiler had been frozen and the steam was all out of the boiler. It was then about eight o'clock, and was growing colder each moment.

"'Necessity knows no law,' and so, after a short consultation, we made a summary appropriation of sundry panels of a post-and-rail fence close to the track, and started a fire underneath the pipe to thaw it. In a short time thereafter we had steam up and resumed our journey toward Philadelphia, arriving at the depot about eleven o'clock.

"Several successive trials were made during the following year; after each, Mr. Baldwin added improvements and made alterations in the machinery. In about a year it was found that the grease had saturated the hubs and loosened the spokes, and they finally went to pieces, and were replaced by new ones."

Of course there is no doubt that Mr. Haskell was either mistaken or insincere in claiming, as late as 1832, this locomotive as the first to be built in America.

(To be continued.)

SAFETY BEFORE SPEED.

THE recommendation of the Public Service Commission for the second district, that extra fast long distance limited trains be run more slowly in winter and spring is an arraignment of the roadbeds of American railroads. After four months of investigation the commission reports that the Hyde Park wreck of the Twentieth Century Limited was not due to a broken rail, as was supposed. On the contrary, the broken rail was due to faults in the roadbed and the great pressure on that rail of a heavy train at high speed; and the trouble in the roadbed, the commission finds, was due to changes in temperature. Freezing and thawing and freezing again injuriously affect the rails and the ballast. Winter weather and snow make inspection difficult and render highly unlikely the detection of changes in position of the rails so slight as the one to which the commission attributes the Hyde Park wreck. Yet when the high speed, heavy limited train comes pounding along there is the possibility of a rail's shifting position or having shifted position enough to break under the pressure or by its displacement to derail the train.

"The record of accidents to fast trains during the last year," says the commission, "raises the question whether the schedules are not too fast for safety. It appears to be evident that, whatever the factor of safety may be in summer, it must be materially reduced in winter conditions." This opinion is given after five years' study of railroad problems in this State. It is confirmed by railroad managers themselves in actual practical operation. In winter they often find themselves unable to bring their limited trains through on time, because they must be run with regard for safety. The Central was particularly unfortunate in its time schedule for fast trains last winter, because it did regard safety rather than the time-card in many instances. Yet it did not escape a wreck.

The American winter climate is beyond the control of the railroads. The time schedules are their own. Speed may be an "American craze," yet most Americans would be willing to take a couple of hours longer for the journey to Chicago if they were certain to reach their destination safely and on time. If safety depends on accommodating speed in winter to the climate and its effect on roadbeds the railroads should acknowledge it and suit their schedules to the fact.—New York *Tribune*.

THE RAILROAD "DOCTOR"

Big Steel Wreckers That Clear the Track When the Old Girl Cuts Up and Hurls Schedules into the Scrap.

TYPE OF THE POWERFUL CRANES USED TO CLEAN UP WRECKS ON AMERICAN ROADS. SOME OF THESE MIGHTY MACHINES CAN LIFT A BURDEN OF A HUNDRED TONS.

WRECKS are the bane of the placid operation of railroads. Aside from their intensely distressing results when lives are lost and bodies are mutilated, and the damage suits that usually arise, they mean the confusion of schedules and expensive delays.

When a wreck occurs, the railroad desires to do two things above all others, and they are, to succor the injured and to clear the right-of-way. Just so long as tracks are blocked in either direction by wreckage, just so long will traffic be paralyzed. To paralyze traffic means to halt freight trains on which depends the prompt delivery of numerous commodities.

Delay may mean the destruction of perishable freight; may mean that the live stock on a cattle train must be fed and watered; may mean the delay of mails and moneys.

Wrecking-crews are immediately despatched to the scene of the accident and then passes from ponderous inertness to powerful and wonderful action that paramount of wrecking appliances—the crane. To appreciate the crane's part in clearing a wreck one must see what a crane actually does. The remains of cars and engines, weighing thousands of pounds, are lifted and set to one side with the ease that a man lifts a glass.

In America, 25,000 cranes and hoisting apparatus are manufactured every year. Industry spends over $25,000,000 for these cranes. One-fifth of them are exported to foreign countries.

The evolution of the crane and derrick is a process that has covered more than a century. Hoisting apparatus did not mean much until steam became the motive-power in about 1850. From the crude devices of many years ago capable of lifting, either by man or water-power, perhaps five tons, the derricks and cranes of to-day have become mighty machines that do not halt before a hundred tons.

The early types of derricks were queer barrel-like contrivances, constructed like circular treadmills, in which men stepped backward or forward to raise or lower burdens. The first forms of hoisting apparatus actuated by other than manual power, were those operated by horses or water-power.

In the instance of water-power, the apparatus was not portable, as it was necessary to construct a tall tower near at hand to furnish the necessary pressure. The towers were later succeeded by an accumulator, invented by Sir W. Armstrong, and steam came into use not long afterward.

Though America transports about 5,000 of the various forms of hoisting apparatus every year, it has fallen to the lot of England to send some of her cranes to America. In one of the accompanying illustrations one of these cranes is shown. It was largely developed in England in accordance with advanced American methods.

The combination of crane and locomotive was deemed advisable because of utility. A crane not in use for hoisting and moving is hardly adaptable to any other purpose. The locomotive feature is applicable to switching. When the crane is not employed, the nature of the construction does not prevent the machine from being used to move cars about a yard.

This type of combination crane and locomotive can be found in large numbers in England.

Among railroad men the wrecking-train or wrecker is known as the "doctor." The significance of the appellation is apparent, for the wrecker is certainly the doctor when the line is paralyzed by an accident

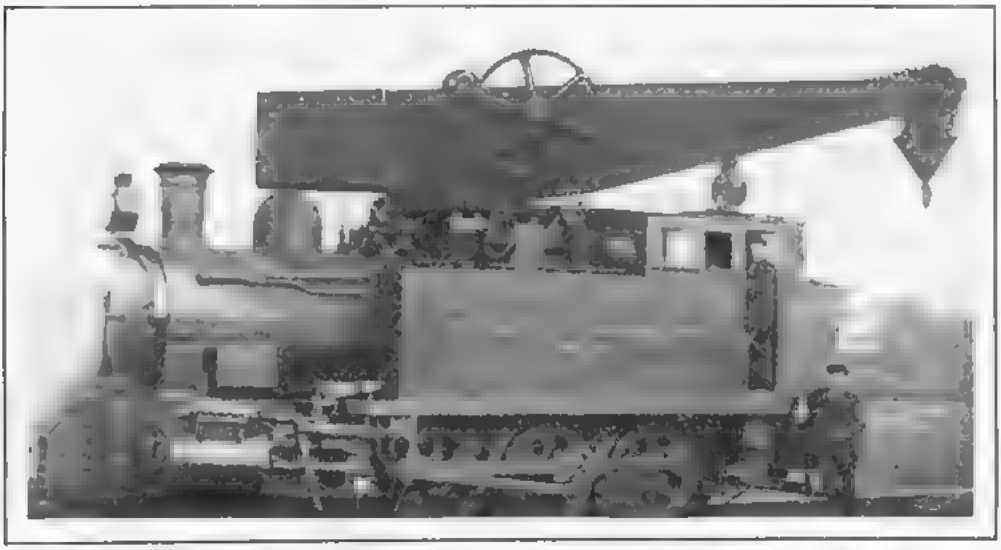
A wrecking-train usually consists of an engine, the crane and a tool-car. The man on whom rests the responsibility of clearing the line is the wreck-master. His tasks may be few, but they are most strenuous. "Lose no time," is the spur that drives him desperately to the task, for every moment's delay means loss of money

His very efficiency lies in the speed with which he can remove the ruins from the rails.

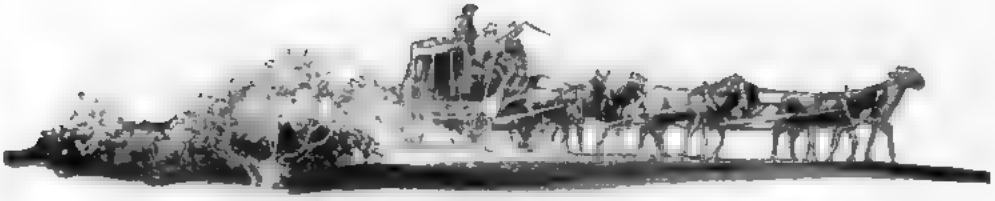
First the passengers must be saved if any are in danger of fire or being crushed beneath the wreckage. In the performance of their duty, the members of the wrecking-crew do not hesitate to plunge into the gravest danger. How many stirring deeds of heroism have marked their lives, or how many of them have gone to their doom to save a passenger in peril, the world will never know. They are men of sturdy muscle and unfaltering courage

Equipment is seldom handled gently if the wreck is a grave one. The damage has been done, and it is a waste of time to spare the remains of battered cars or locomotives.

The "doctor" hoists them and casts them aside that traffic may once more become normal.



COMBINATION LOCOMOTIVE AND CRANE BUILT IN ENGLAND FOR USE ON AN AMERICAN ROAD. WHEN THE CRANE IS NOT IN USE THE ENGINE IS USED FOR SWITCHING. THIS TYPE IS QUITE COMMON ON BRITISH LINES.



Slipane's Man, Sparrow.

BY BARRY LAMONT.

He Looked Starved When He Joined Gang No. 3; But Appearances Are Often Deceptive.

"HANGED if you ain't the double of a hungry sparrow in a hard winter," said "Mud" Slipane, foreman of construction gang No 3.

The small lad whom Mud addressed had slid into camp from no one knew where or cared. He was dirty and ragged His eyes were big and hollow, and his nose seemed to be whittled to a point with hunger.

He walked with the wabble of sheer weakness, and seemed to be looking for a place where he could sleep or die it didn't matter which—without being bothered. He fitted the foreman's simile pretty closely, for, indeed, he did suggest a wobegone bird that hadn't seen a worm in months.

The monaker stuck. As Sparrow he was known to all the camp.

"Where away, me hearty?" went on Mud as Sparrow swayed in his going "What's the trouble? Too much booze or too little grub?"

The transparent, waxy yellow of the lad's face hadn't escaped the eye of Slipane, who, from experience in Placer River Valley, and again in the Selkirks, knew what the tint meant. And as he looked, there came back to him the sensation that arises from the combination of a belt pulled into its last hole and the deadly weakness of starvation

Sparrow steadied himself against a pile of ties and tried to smile

"Nix on the booze thing, cull," he said faintly; "show me some beef and then watch me!"

Mud hooked a mighty arm into one of Sparrow's. "Then you trots with me and feeds your mug. After that we'll try to fix you up. The camp's short on men, and you're good for your two-fifty per sure"

Like most big men, Mud had a heart that matched his inches, and it had gone out to the frail looking youngster who was gripping the ties closely to stay himself from slipping to the ground.

Sparrow shook his head slowly. "I'm down and out on the mazuma proposition, pal. Nary a red in my jeans. You couldn't find the price of a glass of water on me with a search warrant I I"

Mud felt the sudden weight of a limp body on his arm, while the saffron cheek of Sparrow turned to a dull white.

"Here, you chaps!" yelled Mud to Billy Nittle, Moss Noedel, and Libby Sol, who were on their way to the dinner tent, which they dubbed the "hog trough." "Lend a hand here! One of you hunt up the doctor. To the hospital tent with this boy!"

That was how Sparrow made his début at Construction Camp 12 of the Granite and Mountaindale Railroad

This camp was at the head of the procession of similar camps that were slowly pushing their way into the Northwest through primeval forests of larch, pine, and hemlock to Argent City, on the right bank of Grayling River. The G. and M. R. R. had come to the conclusion that linking the city to the main line by means of the branch under construction, and the incidental opening of the intervening country, in the long run would result in the swelling of its dividends. The project had been hastened by the friendly tip given to the Washington representative of the road by a sympathetic Congressman, to the effect that the Homestead and Prairie City Railroad was pulling the legislative ropes for a similar purpose.

The scene of the camp was the southern edge of a tree-covered rise that called for a long and fairly deep cut. Once the ax-men had cleared away the evergreens, the excavators made the dirt fly, for below the top dressing the soil was light and porous.

Things were going swimmingly up to two or three days before Sparrow struck camp. Then there had drifted down from the north the news of a gold strike in the hills on the other side of the Grayling, a hundred odd miles away. The working force began to melt away. Men of all nationalities—so cosmopolitan was the crew—packed duffle-bags, threw down shovels and picks, and scooted away to the new diggings without stopping to take their time. Those who remained were mostly Scandinavians, big, blue-eyed, light-haired men, slow of speech, and with tremendous appetites for grub and work.

Naturally, the representatives of the contracting firm used language with brimstone trimmings as they made the wires sizzle with demands for new men. It was at this juncture that Mud asked the boss of the working outfit to give Sparrow a chance.

"He ain't much to look at, Mr. McLean," said Mud; "but if you'll give him a chance to put meat on his bare bones, he'll earn what he eats. After that I'm sure he'll deserve his time."

"Ye're a judge of men, or ought to be, Slipane," returned the old Scotchman, as he eyed Sparrow with keen but not unkindly eyes. "I'll put him on the pay-roll; but I'm misdoubtin' if he'll be worth anything to ye and your gang."

"I'll do my best, boss; you may bet your limit on that," declared Sparrow emphatically.

"Ye come from New York?" asked McLean abruptly.

Sparrow's cheek flushed a dark red and he paused before he answered.

"Yes, boss," he said at length. "How did you get wise to it?"

"I've lived there, laddie. 'Tis a good place for a youth like yoursel' to get away from. And, Slipane man, that soft fool lad Hornsby, who's been helping Jones with the time-sheet, has skipped with the others. Would this this What's your name, boy?"

"Sparrow," answered Mud.

"John Sparrow," added his protégé.

"Well, Sparrow might fill Hornsby's place temporarily. Can ye write, laddie?"

"Yes, sir, fairly well."

"'Tis a good thing to be able to use your fist— Tosh man! What's bitten ye?"

Sparrow had risen suddenly from his chair and was staring at McLean with a startled expression.

"Nothing, sir," stammered the lad; "I thought you meant—that you were throwing a con—"

"I don't trifle in business matters, boy. If ye care to take six dollars a week and the freedom of the cook-tent, ye can sign on to-morrow morn'."

"Boss, I'm obliged to you for this," began Sparrow, his thin face flashing with earnestness. "You'll find that I'm on the level when it comes to work."

"I believe that ye mean what ye say—at the moment but I prefer to let your labor speak for ye, instead of your tongue."

McLean nodded to Mud to intimate that the interview was at an end; whereupon Mud, gripping Sparrow's arm, led him outside, thereby shutting off the flow of grateful words that were about to pour from his lips.

"That old guy's all to the good and then some," said Sparrow enthusiastically, as he and Mud made for the box car that Mud shared with a dozen others as a sleeping apartment.

"You're right, my chicken. And he'll keep so just as long as you act good to

him. I s'pose you can use a needle and thread?"

"Why?" asked Sparrow, looking the astonishment that he felt at Mud's sudden change of subject.

"I've got it into me that you were a cross-legger a tailor, you know—back East. If I'm right, your trade will come in handy. Now that you're going to be an office gent, you'll have to give the chuck to those duds you're sporting. I'm going to rummage in my wardrobe and try to fix you up to look decent. But you'll have to do a sight of cutting down and sewing up. One leg of my pants ought to make you a pair of trousers!"

"A whole suit, I guess," said Sparrow.

"By the way, Sparrow, what's your trade, anyhow?" said Slipane.

The lad flushed and hesitated. Mud looked at him queerly, but didn't repeat the question. His frontier experience had taught him that it isn't always well to inquire too closely into a man's past.

"I was in the glove business," replied Sparrow at length. His voice was curiously hoarse. "But there came a time when when I hit it had, and so I quit. Been bumming around ever since."

"Oh," said Mud, and he dropped the subject then and there

II.

A MONTH elapsed. In the interval the gaps in the ranks of the working force had been filled; Sparrow had made good with the time-keeper, much to Mud's satisfaction; and the work of construction was proceeding smoothly. Sparrow had improved wonderfully, so far as appearance was concerned. The yellow of his cheeks had given place to a wholesome brown, his eyes were clear, and he carried himself as if he had springs in the soles of his brogans. And gradually the bones of Sparrow began to disappear, exhibiting in their place flesh that was firm and sufficient, and having the touch of "mottle" that tells of prime condition.

"I say, kiddo, but you look fine and fit," said Mud, one sultry Saturday evening when the men were taking a dip in the creek that ran through a broad break in the pines. "Help me if you haven't the build of a slap-up lightweight. I'll have to match you against some lad of your weight! Can you use your mawleys?"

"I don't fight," replied Sparrow rather curtly.

Mud looked disappointed. "That's a pity," he said. "I used to be fond of a mill myself when I was younger, and I ain't so old that I don't know a scrapper when I see one. I'll teach you to box if you want to learn."

A ghost of a smile passed over Sparrow's face. "I'm dead obliged, pal, but it's not in my line," he answered. There was a note of decision in his voice that was unmistakable. "Put me up against any other old proposition, and I'm with you; but nix on the scrap."

"Then hustle on your duds and we'll get outside some of Jerry's firewater!"

Jerry Pitkin's business was to follow the trails of railroad camps for the purpose of selling rank tobacco and worse liquor to the reckless and the unwary. A tent, some full kegs, and planks on empty kegs, and a big club constituted his outfit. The men of the camps gathered around and money was spent freely, for "Jerry's" represented the only "recreation" with which the camp was supplied.

Sparrow said no in a manner that couldn't be misunderstood.

"Not for mine. You ought to know by this time, Mud, that I'm a passenger on the water-wagon."

Mud snorted. "I forgot, boy. Well, on with the duds, come along and swallow something soft, while I poison myself."

Slipane had a common weakness. It took the form of occasional outbreaks with red liquor and poker. At such times, he swallowed the first without chasers and played the second without judgment. Jerry provided cards, chips, planks, and kegs for the "sports" so long as there was no let-up in their thirst.

An outbreak by Mud was about due Sparrow knew it, because a close friendship had sprung up between them, the outcome of gratitude on the part of the boy and the protective instinct of the strong for the weak on Mud's side. Consequently, they were "wise" to their mutual peculiarities.

Sparrow for several evenings in succession had done what he could to sidetrack the craving by spinning yarns about

New York and its glories. Mud's chiefest ambition was to "do" the metropolis—do it from the Battery to the Bronx, with many side trips and stopovers off the main line of the Great White Way. He promised himself and others that this should be done when he made a strike and chucked railroading.

So he questioned Sparrow about the geographical, architectural, social, and saloon features of New York, especially those found along Broadway. Sparrow, who knew his little old town thoroughly, gave him that curious and intimate information not found in guide-books. It greatly increased Mud's desire to make that strike. Incidentally, Sparrow's description took Mud's mind off Jerry's, which was exactly what Sparrow wanted.

But Mud's aridity would not be denied, and there came times when even New York wasn't in it with Jerry's. Such a time was at hand. Sparrow's apparent willingness to stand by while Mud was putting himself outside of Jerry's bottled homicide was due to the hope that he might get his pal away from the tent before he became as unmanageable as a mule, which he usually did when he had taken aboard six or more gulps of Jerry's liquid fire.

There was a full house at Jerry's. Mud and his protégé received an earsplitting welcome as they entered. Mud crashed his fist on the bar, and Jerry, smiling out of his crooked mouth, and knowing that the big Englishman was good for many dollars that evening, slid along the whisky bottle and some lemon soda.

"Give the kid whatever he orders, now or at any time, and charge to me, you grinning bug-juicer!" commanded Mud.

"What'll you have, Bud?" asked Jerry as he turned to Sparrow.

"Gimme something that fizzes and comes out of a corked bottle," replied Sparrow, eying the booze-boss with disfavor; "then I'll know you haven't been up to any tricks with it."

Jerry shot a malevolent glance at the lad. "It'll go into a monkey, anyhow," he retorted. Passing for wit in the saloon, the remark set the crowd roaring.

"Shut up and give the lad his drink!" shouted Mud. "And who wants to lose their pay envelope in a quarter-limit game?" he asked, turning to the crowd.

A half dozen of Jerry's customers spoke their willingness. In a few minutes the first hand was being dealt. Sparrow, seated on a convenient keg, watched the game in gloomy fashion.

One of the players was a man whom Sparrow disliked. His name was "Lump" Hoffbog, and he was in charge of the gang that worked ahead of that of Mud.

Hoffbog was a huge creature whose features and general make-up reminded one of a red-top gorilla—his thick neck merging into his skull without a trace of a curve; his narrow, sloping forehead; protruding jaw; small eyes, and the manner in which he swung his enormously long arms when he walked, made him seem inhuman.

Lump was a bully; not the ordinary, loud mouthed, blustering bully who is one-third bluff and two-thirds egotism, but the bully of the rarer kind who mixes craft and cruelty. He seemed prone to inflict himself and his malice on those who couldn't retaliate owing to their physical inferiority.

Sparrow took a dislike to Lump the first day he struck camp, and Hoffbog returned the feeling with interest. In all probability, Sparrow would have felt the weight of the big fellow's fist if he hadn't been under the protection of Mud, for Mud was about the one man in the outfit that Hoffbog didn't care to meddle with. But his nature wouldn't permit him to disregard Sparrow, so he started a systematic attack on Mud's none too strong sobriety by asking him to drop into Jerry's on all sorts of excuses, inducing him to "bend the elbow" more than was good for him, and to "sit in" poker games that played havoc with his pay envelope. At such times Sparrow would hang around, hoping to induce Slipane to quit. He was invariably unsuccessful, while Lump would taunt him for his failure.

"Say, you sawed off," yelled Lump to Sparrow on one occasion when he had followed Slipane to Jerry's to keep a protecting eye on him, "come and swallow something! Jerry, give the gent some milk and water."

"I don't drink on your money!" retorted Sparrow.

There was something in Sparrow's remark that brought a shout of laughter from the crowd. Mud, his face flushed and his tongue tangled, looked up and laughed thickly.

"You'd better leave Sparrow alone, you tie-shover! Put a chain on your mouth tackle and deal the cards!"

He spoke directly to Hoffbog, who scowled diabolically at Sparrow, but took Mud's advice. Mud crooked his finger at Jerry for another round, and the game proceeded. Sparrow drew near and watched.

Two other men had "sat in." At the end of half an hour Mud, whose reckless play had caused him to lose steadily, proposed that the "ante" should be made a half dollar instead of a quarter.

"Gimme a chance to make good, boys. I've nearly dropped my week's pay."

"Fifty cents goes," said Dick Toons, "if the rest are agreeable."

Hoffbog nodded, and so did the fourth man. Sparrow nudged Mud with a remonstrating elbow.

"What is it, kid?" asked Mud.

"Cut it and come home. It's the rum and not you that's playing—and playing a rotten game at that. You'll lose your job if you stay in. Cut it out!" Sparrow spoke kindly, but forcibly.

Mud smiled a drunken, indulgent smile.

"You mean good, but you don't know what you're talkin' about. In a minute I'll clean up a pile; then I'll come along. Watch me!" he answered none too friendly.

"Dad ain't bein' run by sonny," sneered Lump.

"If there was any running being done round these parts, I'd like to see you run out of camp for the same reason that they poison rats!" flashed back Sparrow.

Hoffbog jumped to his feet.

"You'll keep that whisky-fed carcass of yours glued to your plank," commanded Mud. "I'm full, an' I know it; but I sobers up instant if any one touches that kid."

The game continued, and Mud lost steadily. Finally, after a fruitless search through his pockets for the wherewithal to buy more chips, he unloosed his vest and undershirt with trembling fingers and opened a leather bag that hung from his neck. Hoffbog's eyes sparkled as he did so. He was winning most of Mud's money, and he knew how this call on Mud's reserve funds would annoy Sparrow.

"Stop that, you infernal chump!" said Sparrow, laying his hand on his friend, who was fumbling the strings of the wallet. "You'll lose all you've got. Tie up and get out!"

"The boy's right," added Toons. "If you stay in the game I'm going to cash in."

"Me, too," said the fourth man.

Slipane straightened himself up and looked at the others in alcohol dignity, while Lump snorted jeeringly.

"You're no gen'lemen," stammered Mud. "There's plenty others'll sit in. Get out and make room for real sports, you cheap pikers! An' as for you, Sparrow, stop your yammering or quit."

"You're making a top-side fool of yourself. Well, you'll be sorry for this to-morrow and Lump'll be glad, because he'll have your mazuma."

Sparrow turned on his heel and left.

III.

SPARROW'S prophecy came true. Mud woke up with an aching head, a raging thirst, and an empty wallet. His game cost him nearly $300, his savings for eighteen months. With their going had gone, also, the hope of the Western trip and the "strike" with which it was to be identified. Mud, as he gulped down water to allay the aridity of his throat, cursed himself heartily for not having taken Sparrow's advice, and Lump for having taken advantage of his condition.

In the midst of it all in walked Sparrow.

Mud did not speak, and Sparrow's remarks were brief and to the point. He told his protector just what he thought of him in the frankest possible manner, adding that he had a plan whereby Mud's losses might be regained from Lump, with interest.

"How—tell me," said Mud painfully.

"Nix," said Sparrow. "You're too doped to understand the first line of 'My Country 'Tis of Thee,' and you'll be shrieking for more of the stuff in an hour or so. To-morrow, if you'll brace up, I'll let you in on this; but if you hit it up again—Lump keeps the money."

Mud, finding that Sparrow was obdurate, at length ceased urging him to give up his secret and fell asleep. When he awoke it was late in the afternoon. Sparrow was sitting by his bed

"You're a husky looking booze-fighter," said Sparrow.

Mud groaned.

"Now," went on Sparrow, "I'm going to the chuck-joint with you. After you've stoked, you've taken aboard some food, it's you for the hay. In the morning we'll talk about the plan for making Lump hand over."

Mud obeyed without a murmur. Sparrow did not leave him until he was tucked in his bunk and snoring.

It was before breakfast on the following day that Sparrow told Mud his plan. At the lad's request, they strolled some distance from camp in order to talk it over. Sparrow had scarcely spoken a couple of sentences when Slipane stopped abruptly and looked his companion squarely in the eyes.

"Is this a sure-enough thing that you're giving me?" he asked.

"Wait till I get through and you won't have to ask fool questions," replied Sparrow.

The half-doubt that at first had shadowed Slipane's face vanished by degrees, and in its place came astonishment, followed by admiration. Before Sparrow had finished, the huge paw of Mud closed over the small but sinewy hand of the lad. The eyes of the man glistened with sympathy.

"Sparrow," said Mud hoarsely, "I'd have bet my last cent on you being the real thing the first time I clapped my peepers on you; but what you're telling me —" He drew a long breath as if words failed him. "And it's me that is proud to have lent you a hand when you needed it"

"There's this to be said, though, pal," said Sparrow, as they turned toward the camp. "I'll not start this thing unless you promise that if it goes through, you don't touch booze for three months straight. Is it a go?"

Mud hesitated for a moment. He had already been counting on celebrating Lump's discomfiture by a big spree, and Sparrow's request was a tough one. After a pause he held out his hand to the other.

"I give my word," he said.

On the way home, Slipane surveyed Sparrow from a new point of view.

"When do you propose to try this come-back?" he asked at length.

"We'll have the curtain raiser on Saturday night and the play on the Sunday," snickered Sparrow. "I'd like a few days to rehearse."

IV.

FOR the balance of the week neither Mud nor Sparrow were seen at Jerry's; but, on Saturday evening, about nine o'clock, when the joint was crowded with men in all stages of intoxication, they put in a simultaneous and unexpected appearance, there seemed to be something brewing.

"Here come the sports!" yelled Lump, as he lurched toward the bar. "I thought that you had given Jerry's the shake, Mud—and you, too, pup!"

"Back up and sit down," said Sparrow with more "nerve" than he usually applied to his talk.

Hoffbog turned a dull red and gasped Never before had he been spoken to in quite that tone, and by a kid whom he could squeeze into coffee-cup if his "protector" wasn't around

"Say! You wouldn't dare to talk that way if your papa wasn't here!" shrieked the bully, his little eyes glaring.

There was a bucket of water on the bar for those who had a fancy for chasers. With a swift movement of his hand, Sparrow caught up the dipper and dashed its contents full in Hoffbog's face.

With a shrill shriek of fury, Lump hurled himself on Sparrow; but Sparrow, in some miraculous fashion, wasn't there when the bully arrived. Lump staggered over the floor, made one or two feints, and finally was forced into a seat, where he poured out a flood of black language aimed at Sparrow.

Sparrow listened with an exasperating smile on his lips. Finally, when Lump's language slackened a little, Sparrow walked close to him, and said so all could hear:

"I'm willing to give you a chance to lose your appetite. You're bigger than I am, but I'll put up a fight against you, and leave it to this crowd to see that you fight fair. If you're sober enough to

stand to-morrow, and don't run out of sand during the night, I'll meet you when and where you like."

"Huh! I'll eat you alive," said Lump.

"That is all talk," interrupted Mud. "Money is the only talk. If you're so sure you're going to do this kid, what'll you bet? What odds are you giving that he don't lay you out cold in five rounds?"

Lump glared. "I'll wager five to one that I'll kill him in the first round," he snarled.

"Where's your coin?" asked Mud.

Hoffbog fumbled in an inside pocket and produced a bag of gold coin, which he shook angrily at Mud.

"I see you're keeping my cash safe for me until I win it back. Well, here's seventy dollars of my money which I puts up against three hundred and fifty dollars of yours, that being five to one, on the understanding that Sparrow either knocks you out or makes you quit—the fight to be to a finish!"

For a moment Lump hesitated. Sparrow saw the halt in his action.

"He's goin' to quit!" said Sparrow sharply.

"You lie!" shouted Hoffbog, leaping to his feet. "I take up that bet of Mud's, and if you've got any mazuma that you want to lose, you splint, back yourself as I'm doing myself!"

"And a mighty poor bet you're making at that!" retorted Sparrow. "How much money have you?"

"Over seven hundred—and I put it all up that you'll lie flat and whine before I get through with you!"

"I ain't so much gone on you that I'll take your word for it. Let some white man count your stack, and then I'll divide it with Mud," said Sparrow coolly.

"I'll stand for what Lump says," interposed Jerry.

"Haven't a doubt of it; but what I said was, that a white man should do the counting," added Sparrow.

Jerry scowled, and three men were appointed as tellers. They announced that Lump was the owner of just $710.

"I s'pose I get the same odds as Mud," asked Sparrow. His tone stung Lump to new anger.

"I'll give you six to one, pup!" was the response. "And you'd better leave word where you want to be planted."

Jerry volunteered to act as stakeholder, but Mud refused to consider him. Libby Sol and Billy Nittle finally were chosen as "holding committee." They were among the most industrious, sober men in camp.

V

THE fight was to take place at two in the afternoon in a natural clearing in the pine woods about half a mile from the camp. Half an hour before the time named, practically all the men were on hand, discussing the chances of Sparrow and the apparent madness of his backers.

To a majority it didn't seem that the lad had a ghost of a show against his huge adversary.

Sparrow arrived at the place of combat almost at the same moment as Lump did. No time was lost in getting to work. Ropes and stakes were brought, and a ring was formed in short order. Mud was made referee by acclamation. He made a short speech in which he said that there was to be no funny business on the part of the spectators, no matter which way the fight went. He and his friends wouldn't stand for it. The rounds would be of the usual length, with a one-minute rest between. It was to be a "go" to the finish, and bare fists were to be used.

There being no dissent to these arrangements, he called "Time!"

Sparrow, during the oratory, had been removing his superfluous clothing, and was first in the ring, stripped to the waist. A buzz of admiration ran through the crowd as it surveyed him. The lad seemed to be in perfect condition in the matter of weight, while his flesh was of that clear pink that tells of fine health and athletic form.

The muscles slid smoothly beneath the satin skin, and his step was as springy as a steel blade. He bore himself with a confident air. A slight smile, born of the exhilaration of the moment, played about his lips.

Lump didn't shine by way of contrast, but his tremendous strength was made manifest by his bare and knotted arms and by his massive bull-neck. As he advanced to meet Sparrow, over whom he towered by a full head, his little eyes lit up with vindictiveness and his lips parted in an evil grin.

Sparrow sized him up for a moment, and then resorted to the worn but nevertheless useful ring tactics of "getting the goat" of his adversary. To lose one's temper during a scrap is equivalent to losing one's self-control. It means defeat.

Sparrow started in.

"I'm liable to be prosecuted for this," he said to Lump, as the big fellow drew near. "Cruelty to animals is a crime under the law. Say, what have you done with the organ? Mud's going to give you peanuts between the rounds. Wouldn't you sooner be climbing trees?"

Lump, his face mottled with rage, answered not, but circled round his impudent adversary, preparing for a rush that would wipe out the insults.

Still keeping up his flow of taunts, Sparrow watched Lump closely. At length Lump, maddened beyond endurance by some remark of his antagonist, made the expected rush with arms swinging like flails.

But the lad was not there when the great fists swept the air in the place where he had been. Like an eel, he avoided the blow by side-stepping; but before Lump could recover his balance Sparrow turned and drove his left into the pillowly stomach of the other, following it with a swing that landed right on the pulpy nose.

With a gasp of astonishment and pain, Lump flattened one hand on the buffeted solar plexus, while he felt with the other to see if his snout hadn't been carried away. In a flash Sparrow was back at him, swinging fiercely, and once more landing in the solar-plexus region.

Lump made a clumsy attempt to retaliate, but another whole-hearted whack on the beak was the outcome. Until the end of the round, Sparrow danced around the bewildered bully, stinging him with a shower of blows.

As the bell rang and the men went to their corners, the crowd, which had been silent and surprised, now murmured in wonderment at Sparrow's ring tactics.

When the second round was called, Lump's face was fiendish as he hastened toward Sparrow. The twisting lips seemed to give shape to the word "Murder." With a snarl, he made a rush for the lad with hands outstretched and fingers quivering. It was evidently his intention to grapple with Sparrow and choke or crush him.

"Here, you!" shouted Mud so sharply that Lump halted abruptly and looked around. "Fight with your fists and break clinches when you're told, or I'll declare you a loser!"

Again the men faced each other. This time Sparrow forced the fighting. He danced around Lump like a fox-terrier around an elephant. He shot his rapid-fire fists into the big body in front of him with telling effect. Lump, with the warning of Mud in mind, tried to fight back as best he knew; but his attempts reminded one of the efforts of a bull to gore a mosquito.

Not a blow could he land on the elusive, flitting figure in front of him—whose fists stung him painfully and whose tongue sprayed verbal vitriol.

"I'm wearing him out," said Sparrow to his seconds. "I'm going to keep him busy from now on. In the next round I'll either make him quit or knock him out."

Sparrow kept his word. He kept Lump busy defending himself during the round. The bully was so engaged, indeed, that he had little time for aggressive tactics. He did manage to land a couple of glancing blows on Sparrow's shoulder and upper arm, but this was when Sparrow was delivering blows at short range.

The bell sent Lump staggering to his corner, weak from loss of blood and nauseated from repeated thumps above the waistline. Sparrow, on the other hand, seemed to positively revel in the combat, and there was a light in his eye that Mud had never seen there before.

"I guess that he's nearly done for," muttered Sparrow to his seconds. "Watch me stir him around when I get at him again."

"Ain't you been stirring him as it is?" queried one of the seconds. "I'll bet that his inside feels as if an egg-beater had been at work there."

"Watch!" replied Sparrow curtly.

With the clang of the bell, he walked into Lump like a demon. He shot straight-arm punches into the protesting abdomen; he had right and left jolts that were crowded with steam; he upper-cut viciously; he swung and countered and cork-screwed; he smashed the nose fur-

ther out of shape; he cauliflowered the bully's ears; and his foot-work was such that Lump simply couldn't hit him.

All at once, Hoffbog saw the green of the woods turn black and the surroundings spin before his vision. He knew that he was on the eve of collapsing. Sparrow's punishment and Jerry's whisky were too much for him. With a tremendous effort, he rallied himself and, realizing that he had lost, made a furious rush at Sparrow, determined that he would have some amount of revenge, in spite of Mud's warning.

Sparrow, who had dropped his arms as Lump began to waver, was caught napping. The arms of the giant were wound around him ere he could make a movement of retreat or defense, and he felt the hot breath of his antagonist on his face.

"Break! Break!" yelled Mud, running forward to break the clinch—but Lump's grip began to slacken, and little by little he slid in a senseless heap to the ground.

Mud began to toll off the fatal ten.

VI.

IT was the next morning, and Sparrow was sitting at his desk when Mr. McLean and Mud entered. The old Scotchman looked sternly at the lad and, without returning his greeting, said:

"I understand that ye've been beatin' up Hoffbog so badly that he can't go to work. More than that, he'll be in th' hospital for a week or more. Isn't it true?"

"Yes, sir," replied Sparrow.

"An' more than this, you did th' beatin' on the Sabbath!"

"We fought yesterday. Yes, sir."

"Before I punish you as you deserve, young man, I'd like to know what led you to take th' chance of battle with Hoffbog, who's big enough to swallow you? What made you do it?"

Sparrow looked imploringly at Mud, who smiled and nodded. "Tell Mr. McLean all about it," said Slipane. "You can trust him same as me."

"You tell him," begged Sparrow. Mud cleared his throat and began:

"There was a lad named Harry Wilson, a pugilist, whose ring name was 'Jolt' Macarty. He was a New Yorker, and gradually fought his way up to the lightweight title.

"He was a clean-living boy, and took care of his old mother in good style. She didn't fancy him earning his living as a fighter, but he promised her that when he had made a fair-sized pile he would quit the business.

"He saved and saved, and finally he was within five or six thousand dollars of the sum that he needed to retire from the business.

"Then he was matched against Billy Watts, who was his chief rival in the business. The share of the gate receipts of the match were such that 'Jolt' could pull out after the fight, no matter which way it went.

"Well —" Mud hesitated. "Well—in the second round 'Jolt' hit Watts on the jaw point and he fell like an ox to his death."

Mud glanced at Sparrow, who, with white face and clenched hands, was listening to the story.

"'Jolt,' after being discharged by the police, swore that he would never fight again. His mother died of grief not long after the accident, and he made over all that he owned to the young widow of the man who had faced him on that fatal night. After that the sporting world lost sight of 'Jolt' for two or three years. He was found a couple of months ago. It was not until yesterday that he broke his word about not fighting again. He did so to oblige a friend."

Mr. McLean slowly turned to Sparrow. His head buried in his hands, he was still sitting at his desk.

"'Jolt,' said the old man kindly, as he went toward the boy with outstretched hand, "we need men with sense and fire in this business. You proved yourself to be made of the right mettle—an' if you'll clean up a few more of the likes of Lump Hoffbog, I'll be the first to thank you."

Good clothes help, but no engine was ever efficient simply because of its paint.

SOME HOLD-UPS THAT FELL DOWN.

A Bunch of Stories Told by the Boys Who Were Kept Busy Fooling Indians and Other Marauders During the Early Days of Railroading in Oklahoma.

BY DEAN VAN DER VEER.

"SHAWNEE" JORDAN was one of the 277 inhabitants of Shawnee, Oklahoma. At least, he held that distinction on a certain spring morning when Oklahoma was a territory. On the evening of that same day, however, Shawnee Jordan was one of 2,500 inhabitants of the town, for during the day the Rock Island had brought in the land rushers.

The Rock Island called for more hands to take care of the sudden and tremendous increase in traffic in Oklahoma. Shawnee Jordan answered the call and soon became a full-fledged fireman. His only obstacle to success was that he could not make financial headway against his poker losses. The way he played that game on pay-day kept him short till the next pay-day.

Shawnee town itself, meantime, has forged ahead. To-day it has three trunk lines to serve it. It gives these trunk lines twenty thousand car-loads of freight a year.

Shawnee has the largest railroad shops in the Southwest the shops of the Rock Island

A Little Game for Six.

On one December pay-day Shawnee Jordan started a little game with six sitting in, all of them firemen and engineers

During the game Shawnee excused himself a moment, as he had forgotten something at the roundhouse, and asked one of his friends to deal for him. When he returned and picked up his hand he found that he held four queens. Over a hundred dollars lay in the jackpot—the biggest pot ever heard of in Shawnee.

Shawnee scanned the faces of his friends a moment, then deliberately threw the hand into the discard. The other five players looked at one another with just a suspicion of astonishment. When the hand was played out a pair of jacks won the pot.

An hour later the game broke up, leaving Shawnee dead broke, he having lost every penny of his pay. The five other players put their heads together, and one said:

"He's a chump! And after I gave him my pair of queens, too!"

"Yes, and after I gave him my two queens," said another of the firemen.

"And after we all chipped in like we were millionaires," said a third.

"It was too gauzy," said the wise man of the five. "Shawnee saw through the conspiracy, and you all know he ain't a man to accept charity."

Among the railroad men of El Reno, Oklahoma, there flourished for a month or more in the latter part of 1908 the strangest organization of railroaders ever known. It was called the "Able Seamen's Union," and yet there was no

ocean nearer than the Pacific, nor does El Reno boast of a body of water worthy of able seamen other than Four Mile Creek.

At the time the Able Seamen's Union was formed, nevertheless, there seemed to be sufficient water roundabout El Reno to float the entire American merchant marine. Four Mile Creek was overflowing, and the Rock Island shops and new yards at El Reno were inundated, traffic throughout half the State was suspended, all trains out of places like Guthrie and Oklahoma City were annulled, and a million dollars of damage was done to railroad tracks, crops, and to farms.

The "Sea-Going" Forces.

By evening of the day of the great flood, crews of trains that finished their runs at El Reno had to go home in boats. By midnight, the rising waters had become a surging sea. Human habitations were carried off like so many chips, and human beings were firing shots of distress.

Then came Claude McPherson to take command of the sea-going forces of the Rock Island.

"Shiver me timbers, hearties!" he cried. "We must turn sailors. Into yon ship with you, mates, and heave away to yon derelict to the rescue of the perishing!"

McPherson began stowing railroad men into a boat, and now, acting as coxswain, he made them pull for the derelict, a floating house on which were perched a man, a woman, and a child in danger of falling off and drowning. McPherson and his men rescued them. Then they worked throughout the night performing all manner of deep-blue-sea heroisms.

Next day the foreman of the shops came to McPherson saying:

"Honors are thrust upon some folks, Claude, but in your case you have earned them. We've formed the Able Seamen's Union of El Reno, and we've elected you president."

"Bully!" cried McPherson. "I always suspected I was born to a seafaring life, rather than to braking on a railroad."

A number of shopmen joined him, and McPherson said, "Put her there, me hearties. As the president of this here Able Seamen's Union which you all have formed, I now feel it my duty to stick to the ship till she sinks and to go down to my death fathoms deep in water, provided that I, as the last to leave the ship, don't leave in time."

Prophetic words! They presaged real tragedy for Claude McPherson. Only a month later, when the flood again wiped out the tracks of the Rock Island for miles on the Choctaw branch on which McPherson was braking, his train shot off the rails and into the seething waters. All of the crew were saved except McPherson. He sank with the "ship" as he had prophesied.

That is why the Able Seamen's Union existed for only a month or so. With McPherson gone to Davy Jones's locker, the members of the union refused absolutely to elect any man in McPherson's place as president. And so, the Able Seamen's Union of El Reno, Oklahoma, was disbanded.

Day Turns to Night.

February 12, 1908, is a day which the railroaders of the oilfields of Oklahoma will never forget. Over a region forty miles square there was not a single glint of daylight that day. All day long switchmen signaled with lamps. Trains burned red, green, and white lights instead of displaying flags.

That morning when Tulsa, the capital of the oilfields, awoke at the usual daylight hour, there was no daylight. Eight o'clock, and nine o'clock came, and still it was dark in Tulsa. At the station the "oil train" as the morning train of the Rock Island out of that town is called – stood ready to pull out for Sapulpa and other places in the oil region.

In charge of the oil train was Conductor Druett

"Light the cars, boys," he ordered. "And get your lanterns ready same as if you were starting on a night run."

Then through the darkness, with the headlight searching the tracks and the rear signal-lamps burning brightly, the oil train sped on toward Sapulpa, fourteen miles away.

The region traversed by that train is one of the greatest oil regions outside of

Russia. It is the Glen Pool district. Seventy-five million barrels of oil were shipped out of there in one year.

As the oil train rolled on through what a stranger might have mistaken for the Land of the Midday Moon, Conductor Druett told the anxious passengers what he knew about this suddenly-created Land of Dreadful Night.

Smoke Like a Mountain Range.

"Worst oil fire in the history of the world," Druett said. "At least that's the way the despatchers put it in their wires to Tulsa. It's at Sapulpa. A lot of those big tanks there have busted and a million dollars' worth of oil is going up in smoke.

"The despatchers describe that smoke as a sight of awful and indescribable sublimity. They say the engineers up there have measured the smoke, and it is five thousand feet high. Looks like a mountain range."

When the train reached Sapulpa, a newsboy greeted the train with this cry, "Extra! Pole Cat Creek on fire!" It was as startling as if a newsboy in New York should cry, "Extra! Hudson River on fire!"

"You see," explained Station Agent Gallup, "the refuse oil flowed down into the creek. To save the stream from becoming polluted, the people here have set fire to the oil on the surface of the creek—and that's what makes this dense smoke. I learn, by wire, that at Okmulgee, thirty miles from here, and even at Bushyhead, forty miles away, all is as dark as night and they are burning lights."

A volley of shots was heard. All the passengers of the oil train had left the cars to see the conflagration.

"What's that shooting?" they asked.

"That," said Agent Gallup, "is the firing squad lambasting the tanks. You see, whenever one of these tanks gets struck by lightning, or gets afire any old way, the workmen shoot holes in the sides of the tanks to let the oil out and save the tanks."

"How did the fire start?" a passenger asked.

"A railroad man, a stranger in these parts, started it. But he isn't here now. He's gone across the river."

"What? Across Pole Cat Creek through that fire?"

"No! Across the Styx. That is, his ashes went across—for there wasn't anything of him but ashes when he started over. He was one of those tenderfoot construction engineers they're sending us out here. He had a lot of book learning; but he didn't savvy oil.

"Last evening, after eating his supper, he started for a stroll among the oil tanks. He wanted to smoke, so he put a cigarette between his teeth and struck a match. Well, that's all. He was cremated quicker'n a crematory could do it

"He didn't savvy the fumes hereabouts; didn't know, or forgot, that when you approach a tank you must keep any kind of a light under a bushel."

Pale Face Charlie's Front.

Sunday night, June 11, 1905, a Santa Fe train in Oklahoma was held up under conditions that were singular and really unique. It was something new in the line of attempted train robberies.

Early that evening a special train stood at the Santa Fe station at Bliss, ready to pull out. Passengers, arriving in automobiles, on horseback, and in buckboards, went aboard the special. It was the duty of the special to carry these people eleven miles to Ponca City. Among the passengers were newspaper editors from different parts of the country, and many distinguished citizens of Oklahoma.

They had witnessed that day the last buffalo hunt that will ever take place on the American continent. It was held at the famous 101 Ranch, owned by the Miller brothers. Forty thousand persons were on the grand-stands of the great arena where, that day, the last buffalo ever to be killed deliberately in this country, was struck down by a bullet from a rifle in the hands of a man in a motor-car.

While the special waited at Bliss station, the conductor went forward to the baggage-car, and, addressing two brakemen standing in the car, said:

"Got your guns where you can use 'em, Sibley? And you Belford? Well, then, put 'em away and don't attempt to use 'em."

Sibley and Belford were surprised at this order. Up to that time they had been told to prepare for trouble on the run to Ponca City.

"It's because there won't be anything aboard here for Pale Face Charlie to get," said the conductor. "You see, the fool ranch boys counted that money out on a blanket in the open, in sight of the whole gang.

"It was just a grand-stand way of counting the grand-stand receipts for the day. They counted over forty thousand dollars on that blanket, then they packed the cash in sacks and stowed the sacks in an automobile. They'll be here in a minute with the money."

"But you said there wouldn't be anything that was worth Pale Face Charlie's trouble, on this train," observed Brakeman Sibley.

"And how did they come to know that Pale Face Charlie would take a hand in this, anyway?" asked Belford.

"Now don't get excited," said the conductor. "The Millers had been warned that Pale Face Charlie and his gang of half-breeds would stand up this special somewhere between here and Ponca City. To let the half-breeds think they had no suspicion of what was afoot, the Miller boys counted the cash under the very noses of Pale Face Charlie and his gang.

"And now, here is what you are to do. George Miller will arrive here in a moment in his automobile, with the cash. He will pass the sacks in to you. You will receive them, then close your door on this side of the train. Then, after we start, you will pitch every sack of money through the door on the other side.

"That's your job and that's all you need know about this money. But when Pale Face Charlie halts us—"

The conductor gave instructions in detail and in a very low tone.

Presently George Miller's motor dashed up, the money was handed to Sibley and Belford in the car, and the train pulled out.

While the train sped on, Sibley and Belford, according to instructions, flung sack after sack out on the prairie.

When the special was well out of Bliss, a band of horsemen appeared, shooting into the air and yelling. The engineer saw an obstruction on the track and pulled up.

"Hello, Charlie," said the engineer, addressing the man who, evidently, was the leader of the gang. It was the half-breed, Pale Face Charlie. "What can we do for you, Charlie?" the engineer went on, as if he were greeting a friend.

Pale Face Charlie and his men kept mum and proceeded to the baggage car, the doors of which they found wide open.

"Throw up your hands," was Charlie's orders to Sibley and Belford. Both obeyed. Charlie ordered one of his men to keep the brakemen covered—the others were shooting up and down on both sides of the train to keep the passengers' heads in—and then Charlie himself searched the car.

"What you looking for, Charlie?" asked one of the brakemen, pleasantly. "Money? Well, there isn't a cent of ranch money aboard, and we fellows left our personal wealth at home. What? Going so soon? So long."

Pale Face Charlie and his men started helter-skelter across the prairie.

Half an hour later the special drew into Ponca City. George Miller, in his automobile, met the train and at once sought out Sibley and Belford and said to them:

"Thank you, boys, for letting yourselves get held up without firing a shot. The money is safe in the bank. I told 'em they ought to call their institution the Night-and-Day Bank of Ponca City. Well, it was kind of them to keep open for us at night, wasn't it?

"By the way, boys," Miller added, "Pale Face Charlie overtook us as we were fording a stream—and we had a running fight all the way in. And I suspect that the best kind of an Indian lies on the prairie somewhere between here and the fording place."

Selfishness is the obstruction that blocks the right-of-way to real success and happiness.

On the Editorial Carpet

Here Are a Few Orders to Read When You've Eaten Your Thanksgiving Turkey.

THE CLEAR FOR DECEMBER.

PHIL McGOO, the philosophical old engineer, whose quaint sayings have brightened the way to The Carpet on several previous occasions, once had a verbal encounter with his eldest son who didn't care much for railroading, but who saw a brilliant future in humping freight on one of those antiquated stern-wheel boats that used to ply up and down the Stockton River, California. Between ports there was always a poker-game in progress, and young McGoo, who usually gave his mother part of his weekly pay-envelope to help defray the household expenses, had a long run of bad luck. After several weeks' failure to come across with his share of the bill money, the old man waited up for him one Saturday night and said very kindly:

"You haven't been contributing much lately toward the support of the family, son. Why are you so short of money?"

"It's the way I was raised," replied the youngster.

"That's right," said Phil, changing his mental attitude. "Blame it on your parents!"

If you don't like what appears in the magazine, blame it on the editor. Since our request that our readers shall give us suggestions for new subjects—articles that will interest them, and which they would like to see in print—we have had some very valuable advice. It comes in mighty handy, and it proves to us that you are interested in what we are doing, and that you want to give us your aid.

Keep up the good work!

The December number is so particularly attractive that we cannot refrain from mentioning a few of the leading features.

On January 1, 1913, the United States government will establish and put in running order the new parcels post, similar to the big mail express system that is operated so successfully in Germany. The entire public wants to know just how this big, new, helpful system will operate. Mr. C. H. Claudy, whose special articles and fiction have been a feature of this magazine, will describe fully the new system and its workings.

It took a force of men four years to bore a tunnel through the Swiss Alps to shorten the distance between Germany and Italy; but like all great engineering ventures, it will save time and distance. The story of this gigantic work, known as the Loetchberg tunnel, is replete with the courage and persistence of the tunnel borer. It will be told by Frederick A. Talbot.

Mr. Talbot is the author of "The Railway the Conquest of the World." He has traveled extensively in every country where the 700,000 miles of the world's railways penetrate, and his observations and notes were all made from

close personal study. Mr. Talbot is a careful and entertaining writer. His first article, "Down the Steepest Grade in the World," describing the wonderful rope-line for carrying the valuable cedar logs out of the heart of Africa, appeared in our September number. He is a valuable addition to our staff of contributors.

Several of our readers requested us to give them pictures of the United States army officers who are risking their lives in army aviation, a phase of warfare that is attracting men of unusual courage, to whom the highest monetary consideration is paid. Outside of army circles aviation, owing to its steadily growing roster of deaths, is making only ordinary headway, but Germany, France, Italy, Great Britain, and the United States are competing to see which can make its aviation corps the strongest and most strategical. The facts which we will publish in an article accompanying the pictures are really startling.

Track-laying by machinery is the first mechanical stage in the prepatation of a right-of-way. It is a remarkable and fascinating undertaking. In December we will tell you how it is done.

The telegraph-key has been the first stepping-stone to the ultimate success of some of the greatest men in this country. General Thomas T. Eckert, president of the Western Union; David Homer Bates, Andrew Carnegie, and Thomas A. Edison, are among the many notable men of to-day who began their lives as telegraph operators. Nothing is more inspiring than the story of a successful man and the obstacles he overcame to "get there." The article describing the men who have come up from the key is a condensed Plutarch, full of the ginger that that inspires.

In the December number will appear also a description of the lost-and-found department of a trunk line, an article of special value to apprentices; a close study of the engine despatcher, by Robert H. Rogers. In "Famous Train Robbers" will appear the life story of "Three-Finger Musgrove," one of the most reckless bandits of the early West. In "Ties That Bind" will appear the story of the International Association of Machinists.

The short fiction of this number is particularly strong. We will publish Robert Fulkerson Hoffman's latest story, "A Patch of Blue." Edward T. Glynn has a new hold-up yarn, and A. Hershun, a Kipling of the jungles, contributes one of his true-to-life bo stories.

"The Little Tin Train," by Orlando Moore; "Boarding the Telegrapher," by F. B. Lovett, and "The Train That Was Three Years Late," are some of the best short stories we have printed. Bill, the fireman, will appear in a Christmas story, aided and abetted by his sponsor, F. H. Richardson, and Will H. Greenfield has another good Yuletide yarn entitled "Who Was Santa Claus?"

Aside from these we have scheduled stories by Roy O'Toole, Barry Sampson and H. A. Horris, three railroad men who turn out fiction that measures up with that of the best writers in the country.

A feature of the December number, which we are glad to announce in response to many requests, is a page picture of the New York Central's famous locomotive, the 999, whose record of 112½ miles an hour has never been equaled. There will also appear a startlingly interesting article about Chief Wilkie, head of the United States Secret Service. Mr. Wilkie travels some 14,000 miles a year in his official capacity. Why? We will tell you in December.

All the old-time features will be aboard.

And here's hoping that every railroad man in America, and their families, too, sits down to a big, fat, juicy Thanksgiving bird roasted to a turn and stuffed till it's bustin'!

Will you give us the clear for December?

Don't forget to read page 384!

LEST WE FORGET.

THE people, with traditional indifference, have apparently forgotten the wage dispute between the engineers and firemen and the railroads in the East. They have forgotten the splendid magnanimity with which the railroad men agreed to arbitrate with the companies. And they have forgotten the calamitous conditions that would have been had not these men agreed to arbitrate. Had the railroads been paralyzed by a strike, the East would have faced famine, and business would have atrophied.

But the railroad men have not forgotten, nor will they soon forget the very serious questions that the arbitration proceedings have raised.

The railroads say that they cannot afford to pay the increase demanded and make money. They claim that business does not warrant the increase. The men do not believe it. They will tell you that the roads are carrying more passengers and freight than ever, and that they are working harder. Has the capitalization of railroads anything to do with this?

Not many years ago, a railroad in the West was deemed desirable by a certain man who wrote his name ineradicably on the pages of railroad history. The road was a small one, but paid remarkable profits. Its equipment was of the finest; its men were well paid.

Before the railroad financier acquired control of it, it was capitalized at $42,000,000. Immediately after he came into power, its capital stock jumped to $92,000,000 without a single item of railroad construction having been added to that railroad.

Did it pay dividends then? It did, but only because its equipment was allowed to fall to pieces and its right-of-way to deteriorate to a condition that jeopardized the life of every worker and passenger that rode on it.

Could it afford to pay wages? No. Because it must first pay dividends on $50,000,000 worth of fictitious stock.

Something is wrong if such things stand between men and fair wages.

Does promiscuous immigration affect the standing of the railroad worker—not the engineer or fireman, who must of necessity be of long training, but the section-men and the track walkers?

Railroad men inform us that on some roads section-crews are discharged twice a year and supplanted by cheap foreign labor. They will tell you that some roads take men by the carload from Ellis Island and put them in the places of men who are serving faithfully and well.

The companies do this, we are told, because they think that within a few months the foreigners acquire some knowledge of our language and awaken to the advantages of the right to organize and to demand increases.

Something is wrong if inferior foreign labor is used to defeat the interests of American workingmen.

Should the railroad man—in this instance, the engineer and fireman—receive an increase? On some of the famous fast trains of America there are men earning as much as $150 a month. But what of the conditions of their labor, and what of the vast majority of the men who have no star runs?

On some of these fast trains the fireman shovels as much as twelve tons of coal within three hours while standing on the plunging deck of a locomotive—a place where few men could not stand without support. He must help the engineer to observe the signals. The slightest remissions are punished—sometimes by dismissal.

He may receive good wages, but what of the man on the extra list who may not earn more than twenty or thirty dollars a month? The president of one of the largest railroad brotherhoods in America declared that not more than two per cent of the men receive more than the normal wage scale; probably about forty receive it, and the rest are below normal, sometimes distressingly below it.

Something is wrong if the fact that a few men receive good wages is permitted to defeat a square deal.

Does nepotism operate against the prosperity of the railroad man? He will tell you that railroads which refuse to raise their salaries because, as they say, they are not making money, do not hesitate to create an office paying many thousands of dollars a year, perhaps because the son or nephew of this official or the friend of that official must have a good position.

It has been claimed that railroads are wasting money in this practise. Would it not be more fair to dispose of the parasites and look to the welfare of the men—the men on whom the successful operation of the road depends?

Something is wrong if favoritism and waste is to deprive the railroad man of his just compensation.

Do such wrongs really exist?

If they do, what are the companies going to do? What are the men going to do?

HOSPITAL SERVICE RUN BY MEN.

THE management of the entire hospital service of the Missouri Pacific-Iron Mountain System has been turned over to the 40,000 odd employees of those companies. Heretofore the hospitals were operated as part of the railway system.

The hospital properties to be operated by the employees consist of large institutions in St. Louis, Kansas City, and Little Rock, a joint arrangement at Texarkana, Arkansas, with the Cotton Belt Railroad for the use of its hospital there, and arrangements at more than thirty other points along the line.

In order to build and establish the hospitals and to obtain for them the needed credit for their proper conduct, it was necessary for the Missouri Pacific-Iron Mountain System to advance funds and take charge of operating the institutions. All of the employees and officials have been paying a small assessment each month based on the amount of their salaries. Now that the service has become self-sustaining, the railroad company has decided to turn its management over to the employees who contribute the funds.

There is a board of nine hospital service managers, of which the chief surgeon of the companies is the ex-officio chairman. The remaining eight members of the board are chosen from the following departments of the railroads, each department being allowed one representative: train, engine and yard service, shops, roundhouse and repair yards, maintenance of way and structures, telegraphers, office and station employees, operating department, law department, accounting department, and some other department that may be without representation.

YOUR LEADERS.

WE begin in this number, on pages 354 and 355, one of the most interesting features we have ever published, "The Leaders of the Great Railway Orders of America." The feature is of absorbing interest both to railroad men and to the general public. It is interesting to the railroad man because it places before him the portraits and brief biographies of the men in whom he and all his comrades have placed the faith which all men must have in their leaders; it is interesting because of fraternal ties.

It must appeal to the general public, because it places before it an intimate view of the men who are directing the railroad armies; the armies that make for progress and safety in travel.

In the series we shall include all the orders. To those who have scrap-books, it offers a very attractive supplement.

SAFETY FIRST.

NEVER before have American railroads manifested such a keen and practical interest in the paramount question of safety. In every corner of the land, railroads are organizing clubs and committees to safeguard the passenger. On every large system in America, official attention is being concentrated on ways and means of averting and preventing accidents.

According to statistics of the Interstate Commerce Commission, seventy-five per cent of railroad accidents are avoidable. How to avoid them is the great problem that confronts the railroads of this country. Motion pictures and lectures are being devoted to the subject. Not only is caution being urged, but employees are being thoroughly instructed in the safe ways of work.

This powerful and widespread movement means improvement. It cannot fail to be prolific of good results. The process will probably be gradual, but the railroads of America will eventually become the safest in the world.

ADDRESSES WANTED.

INFORMATION is wanted regarding R. E. Jenkins, last heard from when a telegrapher at Klamath Falls, Oregon, August, 1911. He can communicate with V. by writing to his sister's address.

Information is wanted regarding the whereabouts of Henry Enoch and wife. Mr. Enoch was employed by the Big Four at the roundhouse of the Delaware Division at Springfield, Ohio, about 1887 or 1888. Address MRS. GRACE WILSON, P. O. Box 61, Liberty, Indiana.

Information is wanted of the whereabouts of Attrice Sanders. Last seen at Dallas, Texas, on April 18. He is eighteen years of age, has sandy hair, blue eyes, is about five feet nine inches in height, and weighs 140 pounds. It is important that he should communicate at once with F. O. STANFILL, 2709 Pennsylvania Avenue, Dallas, Texas.

SHALL WE FLAG IT?

EDITOR, RAILROAD MAN'S MAGAZINE:

PUMPKIN pie is good; but what would it be without ginger? Don't "pull a lung" in the magazine now. It has too clean a record. Just keep on improving. My hus-

band is an engineer and I enjoy his railroad slang.—Mrs. D. K., Niles, Michigan.

EDITOR, RAILROAD MAN'S MAGAZINE:

CONCERNING your "Shall We Flag It?" discussion, may I ask just what you mean by "railroad man"?

Who and what is a "railroad man"? Is a woman who earns her bread and butter for years in a railroad office a "railroad man"? Or is she outside the scope of your magazine? By railroad slang, do you mean only the slang of the operating department? I notice that you never publish any of the slang of the railroad offices or the machine-shops. Is it good policy to confine your magazine to just one department of the railroads?

If you say, for instance, "While the shack went back with the flag, the eagle-eye, one of the oldest hoggers on the division, leaned against the Johnson bar and watched a string of brownies ahead make a flying switch."

If you say that, then why not say, "The car-load rate on Omaha was based on the differential coming out of Chicago, while the less than car-load rate east from Reno was fixed by the water competition via Seattle and the arbitrary established by the I. C. C. decision in the Salt Lake case?"

Each sentence is equally meaningless to several hundred thousand "railroad men," to say nothing of the general public, while plain United States would be readable to every one. Slang is like salt: a little flavors, but too much—you know!—"STELLA," Chicago

EDITOR, RAILROAD MAN'S MAGAZINE:

I BELIEVE your magazine is distinctive in its present shape, and I believe it is more largely enjoyed by the greater number of your readers in its present form than if you discarded slang.

If you remove the slang and take out the railroad man's "jargon," you will also remove a very considerable amount of enjoyment—the ginger that differentiates your stories from those found in any other publication. Literature free from slang we can get in a hundred magazines, but in none of the others can we find the every-day expressions of railroad men. —L. R. W., Charles City, Iowa

WE STEP ON A THISTLE.

EDITOR, RAILROAD MAN'S MAGAZINE.

IN your August number is an article entitled "Too Big for Right-of-Way," in which is described and illustrated the transportation of one of the big castings of the new Cunarder "Aguitania" to Clydebank, England. Now, then, Clydebank is on the River Clyde, about nine miles from the city of Glasgow, *Scotland*, the world's greatest shipbuilding center.

All the Johnny Bulls who read that article would be tickled to death, because it reads as if England was going to score again; but here's a canny Scot who has rubbed shoulders with so many of them that he knows them like a book.

Dinna tramp on the Scotch thistle, laddie; it will jag you every time.—A SCOTCH-AMERICAN, Jacksonville, Florida

ANOTHER DOUBLE-STACKER.

I NOTICE in your August issue a cut of a double-stack locomotive. There is also one other. It is owned and operated by the Louisiana Southern Railroad, with headquarters in New Orleans. It is No. 7, and is a larger engine than the one you published. It was in service a few years ago and in best of shape, so I suppose it is in use to-day.—F. J., Mason City, Iowa.

RED THAT DOESN'T MEAN DANGER.

EDITOR, RAILROAD MAN'S MAGAZINE:

I READ with much pleasure the many encomiums of praise from all sections of the country in the July number regarding the improved magazine. Anything I might say would be superfluous, but I must say that I am highly pleased. It is easily worth the price, and more.

Only one concession I ask. Go on and improve it, but don't change the cover. That lurid red is like a spotlight to us. We can see it on the news stand a block away.—W. D. S., Lafayette, Louisiana.

WHO HAS IT?

EDITOR, RAILROAD MAN'S MAGAZINE:

WHO has the smallest and most complete working model of a railroad locomotive whittled out of wood with a pocket knife?

I have seen a few such models at fairs, expositions, and railroad depots, and some were good ones.

Perhaps some of the railroad boys can put me next. Any information will be gladly received. —JAMES J. NELSON, 2136 St. Michael Street (in rear), Cincinnati, Ohio

SHORTEST ROAD.

EDITOR, RAILROAD MAN'S MAGAZINE:

THERE is a railroad running from Watsontown to Berwick, Pennsylvania, a distance of forty miles, with three freight and two passengers running in and out of Berwick each day. The road had six freight-engines, two passenger-engines, and one car. The car must be thirty or forty years old. One of the freight-engines still in use appears to be thirty or forty years old. If there are any shorter roads, I would like to know of them.—R. H., Berwick, Pennsylvania.

EASY-TO-UNDERSTAND DEPARTMENT.

A New Feature to Begin in the December RAILROAD MAN'S MAGAZINE, Will Be Furnished by Our Readers. All Accepted Matter Will Be Paid for by Return Check.

BEGINNING with the December number, the RAILROAD MAN'S MAGAZINE will inaugurate a new department.

It is designed not only to be helpful, but to give all readers of the magazine who may have some new idea in mechanics a chance to bring their ideas before the public.

The department will be conducted by our readers. We will furnish you with a medium in which to describe your ideas and send them broadcast over the world, but you must furnish us the information for which we will pay.

Have you an invention that is practical?

Do you know of a simpler or better way of doing something that is now laborious to thousands of people?

Do you know of some way to improve or make easy the many hardships of shop and factory and railroad?

Have you a new hint or suggestion that you have tried and found practical, and which should be useful to others?

If you have such an idea, invention, or suggestion, send it to the editor of the RAILROAD MAN'S MAGAZINE. For all that are accepted we will send a check by return mail.

Each manuscript should be accompanied by a descriptive drawing or photograph, and not more than 300 words of text. Tell it in less if you possibly can.

Here is the biggest chance ever offered by a magazine for the publication of new, helpful, and popular ideas in mechanics.

The fortunes of many men have grown from simple ideas—the practical application of easy methods which many said were ridiculous.

THE EDITOR, RAILROAD MAN'S MAGAZINE,
175 Fifth Avenue, New York City, N. Y.

A heating progress appeal

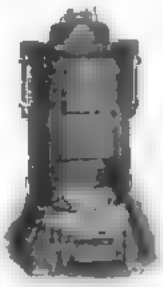
A great writer says that "the civilization of any people can be measured by the amount of sugar and soap they consume, *and the way they treat their women.*" Woman, like man, wants to progress in her home life, as man does in his work. The increasing use of

AMERICAN RADIATORS & IDEAL BOILERS

is strong proof of the higher civilization of the American people.

Their use of IDEAL Boilers and AMERICAN Radiators is rapidly emancipating women from the drudgery caused by old-fashioned heating methods—which taxes woman's time, strength and patience, making daily life a never-ending struggle not to mention the dollar-eating damage to carpets and furnishings by soot, ash-dust and coal gases. In use of IDEAL Boilers and AMERICAN Radiators none of these damaging elements enter the rooms—an immense amount of cleaning thus prevented.

Genial warmth is sent to each room, day and night, as wanted—to the bays, halls, and along outer walls, where other methods do not reach. The heating is not done by scorching-hot metal in the room or cellar burning the vitality of the air, but is distributed steadily through AMERICAN Radiators which softly radiate large volumes of warmth at healthful temperature uniformly through ALL rooms and halls.



IDEAL Boilers and AMERICAN Radiators are now quickly and easily put into OLD buildings, as in new—country or city—without disturbing old heating equipment until ready to start fire in the new.

If there is a womanly appeal for progress in your home, let us answer it with "Ideal Heating" book (free) No obligation incurred to you, no urging on ours. Why not write us to-day?

Made in heavy iron; no parts to warp or wear; will outlast almost any building

A No. 3015 IDEAL Boiler and 175 sq. ft. of 38 in. AMERICAN Radiators, costing owner $125, were used to heat this cottage. At this price the goods can be bought of any reputable, competent Fitter. This did not include cost of labor, pipe, valves, freight, etc., which are extra and vary according to climatic and other conditions.

Write us also for catalogue of ARCO WAND Vacuum Cleaner, that sets in cellar and is connected by iron suction pipes to rooms above. It is the first genuinely practical machine put on the market, and will last as long as the building.

Show-rooms in all large cities

AMERICAN RADIATOR COMPANY

Write Department J
816-822 S. Michigan Avenue, Chicago

Sixty Satisfying Cigarettes or Twenty Plentiful Pipefuls for a nickel!

At the end of the run he rolls his own

The man on the Train knows *the* tobacco for rolling his own cigarettes just the way he wants 'em.

It's Queen Quality—the sweet tasting granulated tobacco that comes in the Blue Bag.

QUEEN QUALITY TOBACCO

Just think of it! Sixty fine, fat, hand-rolled cigarettes for a nickel—*twelve gratifying cigarettes for one cent!* And the flavor so fine that you'll marry the Queen for life. Get next TODAY! For the Queen's true blue!

FREE! A stunning silk Art Kerchief **FREE!**

For the fronts of 25 Queen Quality bags we'll give you absolutely free a superbly colored silk art kerchief wonderful for making bed spreads, pillow covers, kimonos, etc Save the labels of the Blue Bag!

(Offer expires June 30, 1913)

F R Penn Tobacco Co.
The American Tobacco Co., Successors

AND LISTEN! Let us give you FREE a full-sized sample bag of Queen Quality Tobacco Just cut and mail us coupon at corner of this advertisement.

CUT OUT! FILL IN! MAIL TODAY!

"Queen Quality" Department
Drawer "S"
Jersey City, N. J.

Please send free of all charge to me, a full sized sample Blue Bag of Queen Quality Tobacco.

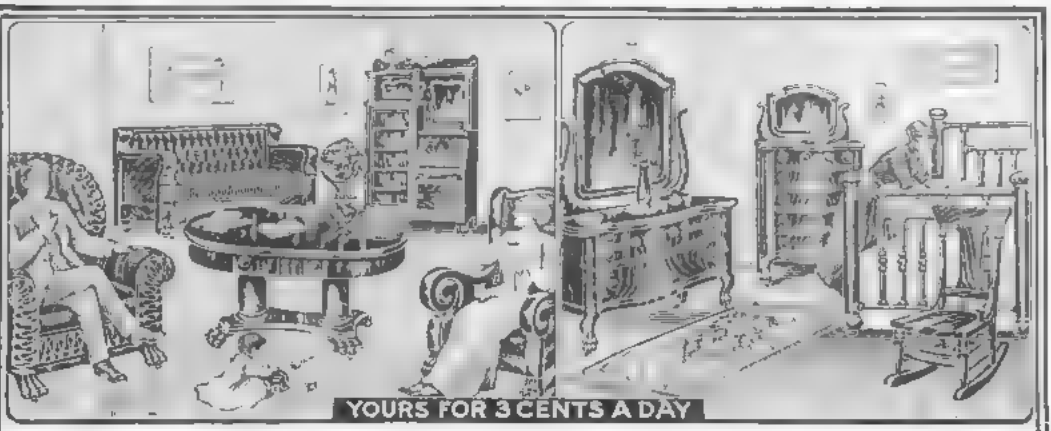
(Offer expires Jan. 31, 1913)
Good only in U. S.

Name . . . . . .

Street . . . . . .

City . . . . . State . . .

"Please introduce me to the Queen"



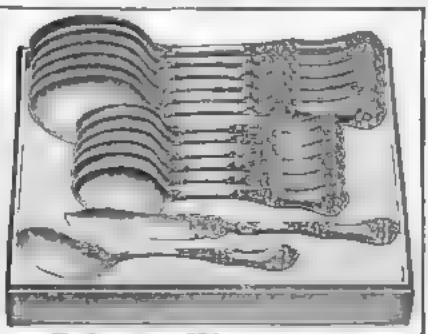
A $3 Silver Set Free

Also Long-Time Credit—Everything for the Home

Here is this month's offer—a $3 gift which will never be offered again.

This offer expires on Nov. 1. If you write before then for our Home Lovers Bargain Book—Fall issue—we will send you with it the order for this set. It will call for the whole set, entirely free, with any order for $20 or over. Or it calls for the half set—a $1.50 set—with any $10 order or over.

4,528 Home Things for 3 Cents a Day



Full Set, Worth $3.00

6 Teaspoons	Butter Knife
6 Tablespoons	Sugar Shell

This handsome 14-piece Silver Set is made by the Wm. Rogers Mfg. Co., of the highest grade, good heavy nickel silver metal, fine pressed and finely warranted not to wear off. The beautiful flower design is nicely embossed on all pieces.

Half Set, Worth $1.50

6 Teaspoons Butter Knife Sugar Shell

This half set contains 3 pieces of the same fine design and high quality as the full set described above. Comes in fancy silverware box.

This mammoth book pictures 4,528 bargains in housefurnishings, picked up from 200 factories. Many of the pictures are in actual colors. It's the largest exhibit ever brought together.

Furniture	Oilcloths, etc.	Pictures and Clocks
Stoves	Draperies	Refrigerators
Sewing Machines	Lamps	Baby Carriages
Mattresses	Silverware	Toys
Carpets and Rugs	Chinaware	Guns

Traveling Bags, etc.

A separate Stove Book pictures 456 Empire stoves and ranges, from 89c up; also a big new book showing Illinois watches and jewelry.

30 Days' Trial

Goods are sent on approval, to be kept a month before you decide to buy. So you cannot make mistakes.

Every price is from 30 to 50 per cent below store prices. We guarantee the lowest prices ever quoted on articles like these.

A Year to Pay

Goods are shipped on open charge account. No interest, no security, no red tape or publicity. You pay as convenient—a little each month by saving a few cents daily.

Over a million homes now have charge accounts with us. Some have had them for 30 years. We shall gladly open one with you on the same convenient terms.

Spiegel, May, Stern Co.

1252 W. 35th Street, Chicago

Send Coupon Now

Send us this coupon and we will mail you free this mammoth Bargain Book. If the coupon comes before Nov. 1 we will also send the order for the Silver Set free.

For your own sake please act now. For this offer ends forever on Nov. 1. It will never be repeated.

Get Our Big Stove Book

SPIEGEL, MAY, STERN CO.

1252 W. 35th Street, Chicago

Mail me without charge your

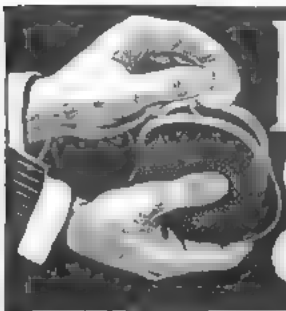
- ☐ Fall Bargain Book
- ☐ Fall Stove Catalog
- ☐ Watch and Jewelry Book

Also order for Free Silver Set

Name .....

Street .....

Town ..... *State* .....



Invest One Cent Save Big Money

7000 BARGAINS ON CREDIT

We will trust you and you can buy any part or the entire home furnishings by mail on credit from our great bargain catalog of 7000 Bargains. In remote towns, you may even add items to establish a charge account, and thus make way from the catalog by simply sending the first small payment. There will be no delay. Shipment is immediately made and full satisfaction guaranteed or your own money back. You can enjoy the luxuries in small monthly payments. Just as you earn the money, and find it convenient.

No. N 5229

Bargain Library Table

This beautiful American quartered oak library table is a genuine bargain, made extra strong. The top is highly polished and an assortment of the magazines or papers can be neatly arranged on the lower shelf. Size 42 inches long. A value that you should not hesitate to accept at double this figure at any retail store. Our price only **$6.95**

Terms: $1.00 down and 75c a month

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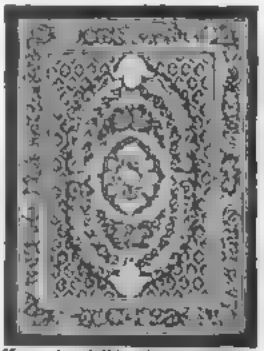
Simply ask for our big new free catalog and we will open an account for you on our books. You do not need to make any payment down. You do not have to give any security. You are not asked to give notes. There are no mortgages. No interest charges. No red tape. We want to sell you on honor. We want you to have the use of the things you need in your home while you are paying for them. We want you to buy and wear and use and enjoy the things you order. Then pay for them out of income. Make small monthly payments. Do not ask for it all at once—just a little at a time monthly.

N1283

30 Days' Free Examination

You have 30 days after you receive any article you order from us in which to examine it. If for any reason you do not like it, or do not want to keep it, return it to us and we will refund your money. Don't hesitate to order from our catalog because you have not had dealings with us before. We have been in business for many years and have thousands of customers all over the country who have ordered, and know that they have received more than what we have claimed for it.



Kremlin Wilton Velvet Rug

No. N 34... Size 9x12 ft.

Change the appearance of your room with this Kremlin Wilton velvet rug. A new rug means a fresh and cheerful room. Brown and tan colors predominate, with touches of red and blue. The rug is offered in 40 patterns, including floral, conventional, oriental and Chinese effects. Closely woven and reversible. Has deep pile surface and fringed ends.

Price only $14.95

Terms: $1.50 down and $1 mo.

Rocker Bargain

No house has ever offered you a bargain like this. Extra large size, full 42 inches wide, deep comfortable seat, high back. A wonderful bargain. Made of selected hardwood, finished in Early English. Black leather seat. Guaranteed for several years' wear. Regular $40 value. Our bargain price only **$30**

Terms: 50c cash and 50c monthly

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Note the certificate shown below. You get one of these certificates when you buy a STUDEBAKER, the famous South Bend Watch—Railroad model.

It protects you as follows—

If time requirements on your road change within five years or if you go to another road where requirements are different and the Studebaker does not conform or cannot be made to conform, WE MUST GIVE YOU A NEW WATCH FREE THAT DOES CONFORM.

No other manufacturer gives such protection. No other makes a finer watch. There is no railroad model that has made the great records that the Studebaker has achieved.

Engineer Mark Floyd of the "TWENTIETH CENTURY" carries a Studebaker. It has run five months without losing or gaining enough to show on the minute hand. Hundreds of Studebakers are doing these things. You want a watch as good.

The SOUTH BEND Studebaker

Railroad Watch

Six months are spent just in the making of every Studebaker, merely the cutting, finishing and assembling of the parts. Six months more are then often necessary to regulate this watch to the point where it will stand the South Bend tests. Each watch is inspected 411 times in the making. Each must run accurately for 700 hours before it is deemed good enough for the name "STUDEBAKER."

Then the Studebaker is sold only by expert retail jewelers, men who know how to regulate it to the *personality* of the buyer.

You buy real watch service when you buy a Studebaker, a lifetime of time-satisfaction—a good looking, trim watch that you are proud to show your friends.

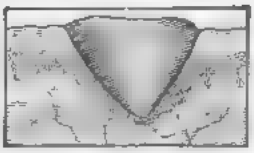
Write for the free book, "How Good Watches Are Made" and a SAMPLE OF THE SOUTH BEND CERTIFICATE that guarantees you against the expense of a new railroad watch for five years.

You will never have cause to regret the buying of *a Studebaker.*

The South Bend Watch Company

11 Rockford St., SOUTH BEND, IND.

(109)



Here's a Corn

And Here's the Way to End It

To pare that corn means to cut off the top of it. The rest is left to grow. Then you pare it again, and so on forever.

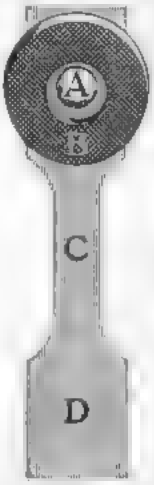
If you let the blade slip it may cause infection.

Every old-fashioned treatment is equally useless. The only way to end the corn is to remove it.

There is now a wax which does this—the B & B wax. It is used in the Blue-jay plaster.

This little plaster is applied in a jiffy, and the pain stops instantly. Then the wax very gently undermines the corn. In 48 hours you can lift the corn out, without any pain or soreness.

Don't doubt this, for sixty million corns have been removed in just this simple way. End yours in that way *now*.



A in the picture is the soft B & B wax. It loosens the corn.
B protects the corn, stopping the pain at once
C wraps around the toe. It is narrowed to be comfortable.
D is rubber adhesive to fasten the plaster on.

Blue-jay Corn Plasters

Sold by Druggists—15c and 25c per package

Sample Mailed Free. Also Blue-jay Bunion Plasters.

Bauer & Black, Chicago and New York, Makers of Surgical Dressings, etc.

(255)

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Styleplus Clothes $17

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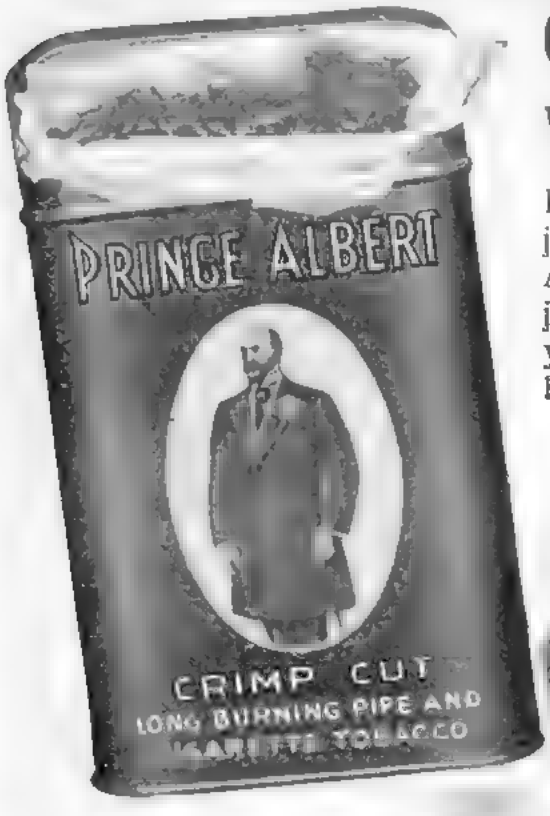
Styleplus Clothes $17 are of all-wool and all wool and silk fabrics hand tailored, *completely protected and sold under a strict guarantee.* Look for the Styleplus agent near you and try on a Styleplus suit or overcoat

Look for the Styleplus label in the coat. Look for the Styleplus guarantee in the pocket.

HENRY SONNEBORN & CO., Baltimore, Md.



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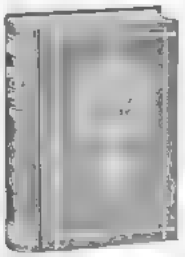

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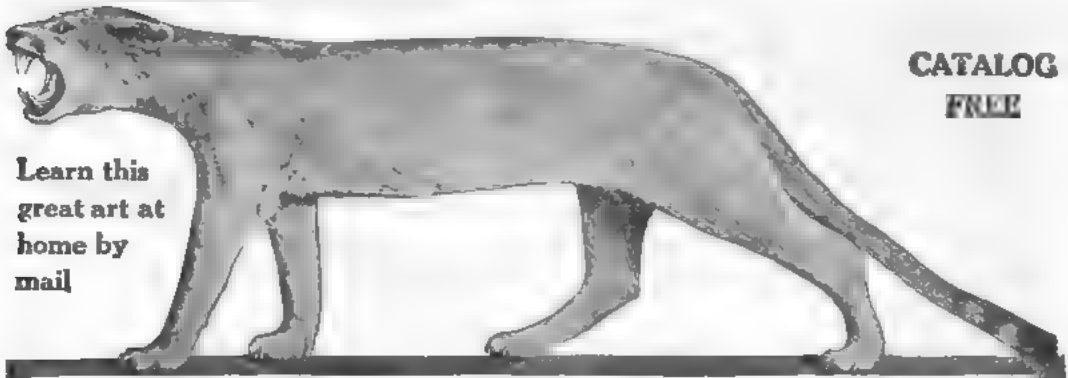

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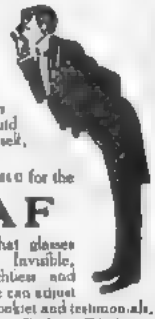

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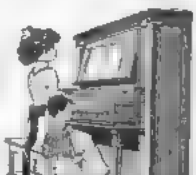

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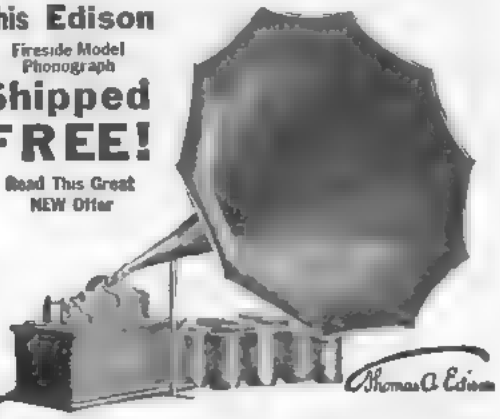

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OUR OFFER

We will send you this Genuine Edison Fireside Outfit direct from our factory to your home. Model [illegible] with Moulded and Amberol Records, for an absolutely Free Loan. We don't want a penny in advance. Don't pay us a penny. Just write us a postal or letter and say you will accept our offer. Further we will give you a selection of 25 free records so that you can hear it and play it in your own home.

WHY WE WANT TO LEND YOU THIS PHONOGRAPH

We know that there are thousands of people who have never heard the Genuine Edison Phonograph. Now, there is only one way to convince people that the Edison is superior, and that is to let them actually see and hear this remarkable instrument for themselves. That is why we are making this offer. *Just as soon as you write us we will send the Edison Phonograph for your free trial in your own home.* Give it a thorough test, and if you don't want to keep it after that, send it back at our expense and the trial will not cost you a penny.

All You Need Do

As we want to distribute as many Edisons as possible in a short time, we are making a special proposition to the first few people in each locality who write us. If you are one of the number you will receive with the Edison Phonograph a complete assortment of Edison Records. Don't fail to write us at once, as we cannot promise to have a Edison Phonograph and Records for every one who writes us. We will not blame you in the least. You won't be asked to act as our agent or even assist. Use the Edison Phonograph in your own home entirely free.

If You Want to Keep the Phonograph

[illegible] you want to keep the Phonograph after the free trial, you may do so on the easiest kind of payments. Only a few cents per week. There is absolutely no interest to pay. There are no collectors. Only a few cents per week. There is absolutely no red tape or delay in getting the Edison Phonograph and Records. We will not bother you in any way. Only a few cents per week. There is absolutely no interest to pay. There are no collectors. Only a few cents per week. There is absolutely no red tape or delay in getting the Edison Phonograph and Records.

Our Easy Payment Plan

[illegible] amount pays for the Edison Phonograph and Records. There is absolutely no interest to pay. There are no collectors. Only a few cents per week. There is absolutely no red tape or delay in getting the Edison Phonograph and Records. We will not bother you in any way. Only a few cents per week. There is absolutely no interest to pay. There are no collectors. Only a few cents per week. There is absolutely no red tape or delay in getting the Edison Phonograph and Records. We will not bother you in any way of any kind, and the payments are so very small, and our terms so liberal you never notice the payments.

FREE [illegible] and Amberol Records [illegible] Trial Certificate entitling you to this grand offer. Sign [illegible] letter now. No obligations—get catalog.

F. K. Babson,
EDISON PHONOGRAPH DISTRIBUTERS
Edison Block, Dept. 1108, Chicago, Ill.

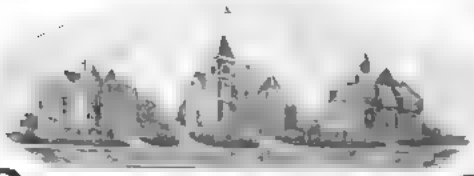
We [illegible] Edison Phonograph Distributers [illegible] Canadian Office: 355 Portage Ave., Winnipeg, Canada.

F. K. BABSON
PHONOGRAPH DISTRIBUTERS
Dept. 1108
Edison Block, Chicago, Ill.

Please send me, without any obligation on my part, your New Edison Phonograph Catalog and full particulars of Edison Gold Moulded and Amberol Records and Free Trial Certificate entitling me to your grand offer, all free.

Name .....

Address .....



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282 Pages 2561 Articles described 788 Illustrations 67 Color Plates Every Musical Instrument. Superb Quality Lowest Prices. Easy Payments. Mention instrument you are interested in. We supply the U. S. Government.

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BARODA DIAMONDS — Flash Like Genuine DIAMONDS. ANY STYLE

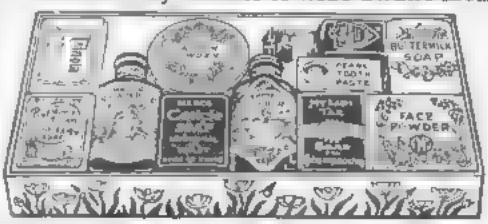
DIAMONDS

at 1/40 the cost—IN SOLID GOLD RINGS

Send us your name and paper cutting on. We guarantee [illegible] See them first then pay Special Offer [illegible] Catalog FREE, [illegible] The Barada Co., Dept. A12 Leland & Grace Sts., Chicago

$3000 I WILL PAY YOU $3000
To Work For Me This Year

I've got the greatest money-making proposition in the country to offer to wide-awake men



Easy Work—Big Pay

I BACK YOU with my capital and experience and [illegible] Soaps and Toilet Articles [illegible] 50 per cent profit [illegible] to 800 per cent profit [illegible] 10 per cent [illegible] reverse. [illegible] 50 per cent [illegible] 10 per cent [illegible]

What Others Are Doing

[illegible] The following week one day [illegible] over $60 a week. J. C. Messick reports [illegible] sales a day, far beyond the $3000 a year mark [illegible]

SPECIAL OFFER

[illegible] I am making a Special Offer whereby you can get [illegible] Get [illegible] bring you the whole proposition FREE. Send [illegible]

E. M. DAVIS, Pres. E. M. Davis Soap Co., 667 Davis Building, CHICAGO

In answering any advertisement on this page it is desirable that you mention RAILROAD MAN'S MAGAZINE.

Hansen's Protector

No. 326

Made of strongest, softest horsehide. Per pair $1.75 and $1.85.

"Hansen's are the Best Gloves I Ever Had on My Hands"

—Orlando S. Young, Passenger Fireman, Logansport

These are the exact words of this popular Western railroad man. He adds, further—"You can use my name as reference about Hansen's Gloves, for they wear like iron."

Hansen's Gloves

are made of the best leather from prime skins scientifically tanned so that best possible service must result. And in spite of water, heat and sweat they keep their shape and remain soft. Even gasoline leaves them soft and shapely.

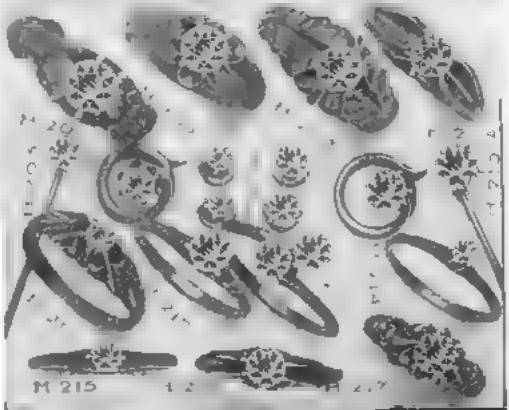
The sturdy "Protector" or the lighter Glad Hand are big favorites. So is the Switchmen's mitten.

All the Hansen line for all work or sport, is fully described in our Free Book. Write for it and order from it, if there's no dealer handy. Write us *now*. We'll send on approval, if necessary.

O. C. HANSEN MANUFACTURING CO.
126 Detroit Street, Milwaukee, Wis.

Handsome genuine leather Card Case sent postpaid, for 35c. Transparent pocket for lodge or membership card and two additional compartments for currency, cards etc. Holds cards up to 2¾x4 inches.

Genuine Perfect Cut DIAMONDS



$97.50 Per Carat Direct from the IMPORTER to You $97.50 PER CARAT

Our amazingly low price due to direct importing and selling, enormous sales, without losses or expenses. 35th successful year. ⅛ carat genuine perfect cut diamond, $8.75. ¼ carat, $17.50. ⅜ carat, $31.25. ½ carat, $48.00. ¾ carat, $67.50. **1 carat and over $97.50 per carat.** 14K. solid gold Mountings at **manufacturing cost,** included in prices below.

No.	*Illustrations Exact Size* Description	Price of Mtg.	Size of dia.	Price of dia.	Price Complete
H201	Carved Solitaire	$4.75	1 carat	$97.50	$105.00
H202	Polished Solitaire	5.50	¾ carat	67.50	73.00
H203	Lion's Paw Solitaire	7.00	½ carat	47.00	52.00
H204	Tooth Solitaire	6.50	⅜ carat	31.25	36.75
H205	Solitaire Pin	5.00	½ carat	17.50	22.50
H206	Solitaire Stud	2.25	¼ carat	17.50	19.75
H207	Solitaire Ear Screws	3.00	Two ¼ c.	16.50	19.50
H208	Solitaire Ear Screws	3.00	Two ½ c.	35.00	38.00
H209	Solitaire Stud	2.25	½ carat	45.00	47.25
H210	Solitaire Pin	5.00	¾ carat	67.50	72.50
H211	Fancy Solitaire	4.00	¼ carat	18.00	22.00
H212	Engagement Solitaire	3.75	½ carat	45.00	48.75
H213	Twin Ring	5.00	Two ¼ c.	62.50	67.50
H214	Engagement Solitaire	3.75	⅝ carat	8.25	12.00
H215	Engagement Solitaire	3.75	¾ carat	17.50	21.25
H216	Fancy Solitaire	4.75	¾ carat	31.25	36.00
H217	Fancy Solitaire	4.75	½ carat	45.00	49.75

The Wonderful Basch Plan offers more than words. Lowest prices. Absolute safety and satisfaction assured before you see before you pay! No deposit required. We send on approval to your City and allow you to examine and approve before purchasing. No obligation to buy! We pay every expense!

Astonishing Money-Back Guarantee!

with every diamond a written legal contract with three remarkable features:

1. We guarantee to buy back every diamond for 90% in Cash.
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SEND NOW FOR THE **BASCH DIAMOND BOOK (FREE)** **Do It Now!**

196 pages, illustrated, artistic cover in colors, shows newest fashions in diamond jewelry, watches, gold, silver and platinum jewelry, actual photographs from a million-dollar stock. Tells all about wonderful Basch Credit Plan and Money-Back Guarantees.

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Please send FREE new Basch Diamond Book without obligation.

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GET IN THE SMOOTH SMOKE CIRCLE

Velvet

THE SMOOTHEST TOBACCO

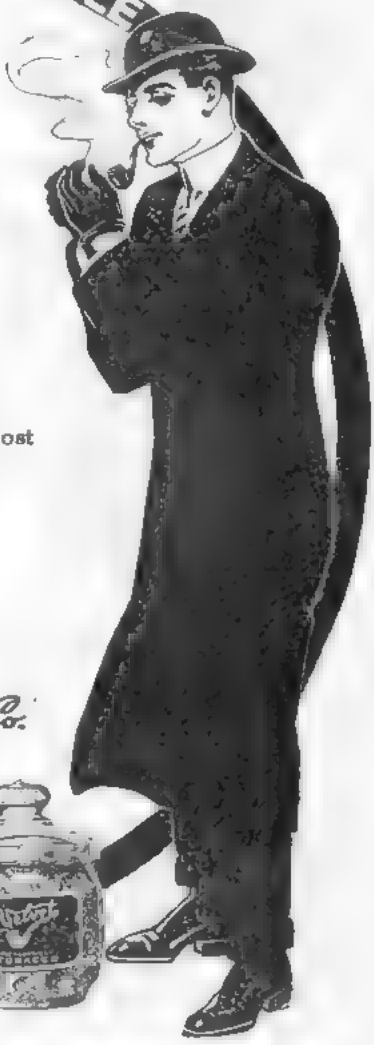
Real companionship for the pipe.

The choicest Burley leaf that grows—perfectly matured.

A mellowness which makes the flavor most delightful—a smoothness unequaled.

Smoke "Velvet"—
it will give you *all* the pleasure.
Too smooth to irritate!

Ask your dealer for a tin of Velvet—
You *will* enjoy it!

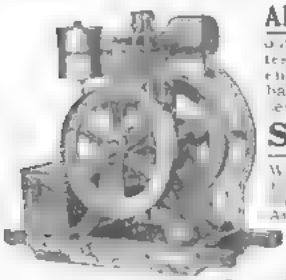


NOT A BIT OF BITE

Liggett & Myers Tobacco Co.

10¢ TINS. Handy 5¢ Bags—
or one pound glass humidor jars.

Only $7.50 After Trial—Nothing in Advance



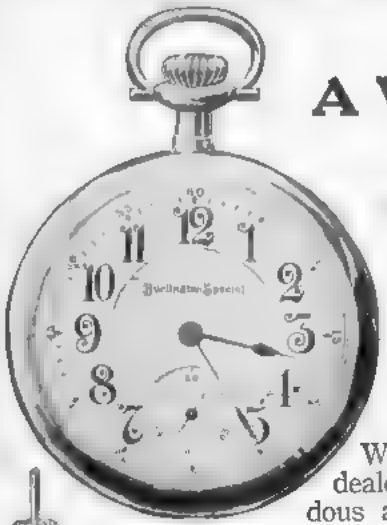
AMAZING OFFER, NOTHING LIKE IT! To [illegible] offer. Not a cent to [illegible] engine. The [illegible] test [illegible] side wet or wet and dirty gas. If it isn't the easiest running perfect engine for [illegible] use on the farm or [illegible] (and you are the judge) [illegible] back. That's [illegible] Write for particulars to-day.

Send No Money Don't send a cent. **Easy Payments**

[illegible] give first [illegible]

SCHMIDT BROS. CO. ENGINE WORKS, Dept. 1108, DAVENPORT, IOWA

Startling Watch Offer



READ!
A Watch Offer Without Parallel

Write for our FREE book on watches; a book that posts you on watches and watch values—explains reasons for our most remarkable rock-bottom-price offer DIRECT TO YOU on the highest grade Burlington.

IF YOU WANT a highest grade watch (ladies' or gentlemen's), or if you ever expect to own such a watch, write NOW for the FREE Burlington book. See coupon below.

We **won't** "knuckle down" to selling systems among dealers, so we have decided to make such a tremendous and wonderful offer direct to the public on a first-class time piece, that no trust, no dealers under contract will or can stop us. **You too** will seize this opportunity to get the "Burlington Special" direct on this wonderful offer.

You should not buy a worthless watch just because it is cheap. Nor need you pay trust prices now for a top-notch watch. The free Burlington book explains.

$2.50 a Month at the Rock Bottom Price

$2.50 a month for the world's most superb time piece? The easiest payments at the rock-bottom price—the **Rock-Bottom price.** *To assure us that everybody will quickly accept this introductory direct offer, we allow cash or easy payments, just as you prefer.*

No Money Down

We ship the watch on approval, prepaid (your choice of ladies' or gentleman's open face or hunting case). You risk absolutely nothing—you pay nothing—not one cent unless you **want** the great offer after seeing and thoroughly inspecting the watch.

Get the Free Burlington Book

THIS BOOKLET will quickly convince you that you **DO** want a watch made in the independent factories fighting the trust as best it can by giving better quality and superior workmanship throughout; we will quickly convince you that the Burlington watch, on which there is only **one** rock-bottom price (the same rock bottom price everywhere), is THE watch for the discriminating buyer, that it is THE watch for the man or woman who wants the highest grade watch which everybody has, but the **best** watch the watch bought by experts. THE watch that is absolutely perfect as to accuracy of super construction. **The Burlington Watch. You will be posted on inside facts** and prices when you send for the Burlington Company's free book on watches.

BURLINGTON WATCH COMPANY
Dept. 1108, 19th and Marshall Blvd., Chicago, Ill.

Now Write

for the free book. It will tell you what you ought to know before you even examine a watch. It will tell you the inside facts about watch prices, and will explain the many superior points of the Burlington over the double priced products. Just send your name and address **today.**

No Letter is Necessary. COUPON Will Do

CUT OR TEAR ON THIS LINE

BURLINGTON WATCH CO.
Dept. 1108, 19th and Marshall Blvd.
CHICAGO, - ILLINOIS

Please send me, without obligation, your free book on watches and copy of your $1,000 challenge, with full explanations of your cash or $2.50 a month offer on the Burlington Watch.

Name .....

Address .....

.....

A Proverb of Bell Service

Once upon a time there dwelt on the banks of the holy river Ganges a great sage, by name Vishnu-sarman.

When King Sudarsana appealed to the wise men to instruct his wayward sons, Vishnu-sarman undertook the task, teaching the princes by means of fables and proverbs.

Among his philosophical sayings was this:

"To one whose foot is covered with a shoe, the earth appears all carpeted with leather."

This parable of sixteen hundred years ago, which applied to walking, applies today to talking. It explains the necessity of one telephone system.

For one man to bring seven million persons together so that he could talk with whom he chose would be almost as difficult as to carpet the whole earth with leather. He would be hampered by the multitude. There would not be elbow room for anybody.

For one man to visit and talk with a comparatively small number of distant persons would be a tedious, discouraging and almost impossible task.

But with the Bell System providing Universal Service the old proverb may be changed to read:

To one who has a Bell Telephone at his lips, the whole nation is within speaking distance.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

AND ASSOCIATED COMPANIES

Every Bell Telephone is the Center of the System.

How R. L. Thomas Spanned the River

Read this story—just another instance of real success won through I. C. S. help. It tells how R. L. Thomas, of Eureka, California, advanced from ranch hand to City Engineer. It shows what ***you*** can do through your ambition, plus I. C. S. training:

EUREKA, CAL., Dec. 14, 1910.

STUDENTS AID DEPT.,
I. C. S., SCRANTON.

"It was early in the year 1902 that I first heard of the I. C. S. I was working on a ranch at the time, and in line of my duties, went to help work a ferry-boat during a great storm.

"I spoke to one of the travelers, and he told me that he was temporarily traveling as an agent for a school that taught by mail. This interested me, but we had no time to talk, as a ferry-boat at the high-water stage in Northern California, needs attention, and is not a convenient place to show literature. But he asked me my name and said the resident agent would send me information.

"I enrolled, I think, some time in April, 1902, taking a Surveying and Mapping Course.

"In 1908, while Deputy Surveyor for Humboldt Co., California (position secured through I. C. S. training), I drew the plans, got out the stress sheets and bills of material, and made the cost estimate for the steel structure that now spans the river at the same crossing, where that water-soaked, half-frozen and thoroughly miserable man, yelled at me with chattering teeth, through the cutting wind and blinding rain, that there was a school that taught things by mail.

"February, 1909, I was appointed Municipal Engineer for the town of Fortuna, California, and held both positions.

"In July, 1909, I resigned from both of these last positions, to take the office of City Engineer of the City of Eureka, California, to which position the people of the city elected me in June, 1909, and which position I now hold.

"My income has increased about six or seven fold on account of the training I received from the I. C. S., and I am just getting started"

Yours truly,
R. L. THOMAS.

You, too, can span the gap between a poorly paid job and a position you'll be proud of. The first step is simply marking the coupon opposite the occupation that most appeals to you. Mark the coupon today. It costs you nothing to do so. You assume no obligation. The coupon will bring advice and information that will clear the road to success for you.

Mark it NOW

INTERNATIONAL CORRESPONDENCE SCHOOLS
Box 1003, Scranton, Pa.

Please explain, without further obligation on my part, how I can qualify for the position, trade or profession before which I have marked X.

General Foreman	Electrical Engineer
R. R. Shop Foreman	Machine Designer
R. R. Traveling Eng.	Electrician
R. R. Trav'g Fireman	Mining Engineer
Locomotive Engineer	Mine Foreman
Air-Brake Instructor	Foreman Machinist
Air-Brake Inspector	Chemist
Air-Brake Repairman	Assayer
Mechanical Engineer	Architect
Mechanical Draftsman	Bookkeeper
R. R. Construction Eng.	Stenographer
Surveyor	Advertising Man
Civil Engineer	Automobile Running
Banking	Concrete Construction

Name. .....

Employed by..... R. F. D.

Employed as.....

Street and No.....

City..... State.....

R19

The flavor of Spring—

VEGETABLES as fresh and tender as if you had picked them right in your own garden this morning; and with all their juicy nourishing qualities perfectly retained—that is what you get in

Campbell's VEGETABLE SOUP

The rich beef stock is plentifully supplied with peas and baby lima beans, corn, rice, barley, sweet and white potatoes, tomatoes, celery, carrots, ham, imported macaroni alphabets—32 different ingredients in all.

No home kitchen—not even yours—could produce such a soup as this, no matter how much time and trouble you take over it. Order at least half-a-dozen at a time. And try it *today*.

"My *Campbell Soup* yearning
Two plates will not smother
And so I'm returning
With hope for another".

21 kinds 10c a can

Asparagus	Clam Chowder	Pea
Beef	Consommé	Pepper Pot
Bouillon	Julienne	Printanier
Celery	Mock Turtle	Tomato
Chicken	Mulligatawny	Tomato-Okra
Chicken Gumbo (Okra)	Mutton Broth	Vegetable
Clam Bouillon	Ox Tail	Vermicelli-Tomato

Look for the red-and-white label

"Gee! I Wish I Were a Royal Tailored Man"

Copyright 1912

"that Royal-Tailored Look"

At the foremost men's wear store in your town

—where you buy your choicest cravats and shirts—you can order your Royal Fall Suit or O'coat—to be tailored to your measure in our New York or Chicago custom shops. ¶ Perhaps this dealer carries a well-chosen ready-made stock—*for those whom stock-clothes content.* But for you men who want your clothes built exactly to your lines and liking; for you men who insist on "made-to-order individuality"—he has a Royal Tailor corner. At $20, $25, $30 and $35 your local Royal dealer can give you your selection from half a thousand of the latest and richest Fall Woolen Exclusives. ¶ And for even as little as $16 you can order a Royal built-to-measure suit from a generous assortment of patterns. Backed by all the Royal features of guarantee, too.

(Special to Foremost Clothiers:—If your store—the best in your town—is without a Royal Corner, it is an exception to a fast growing rule. Write for special proposition.)

SIX BIG FEATURES
In Royal Tailor-Made Clothes
•Made to Your Measure
•All Pure Wool
•A Legal Guarantee With Each Garment
•Will Not Shrink
•Cost No More Than Ready Made
•Six Day Schedule Delivery
This Garment Is Guaranteed to Fit Satisfy and Please You in Every Respect or We Ask You Not to Pay One Penny

$1 A Day Cash Forfeit When A Garment Isn't Finished On Schedule.

The Royal Tailors

Chicago *Joseph Nelson* President New York

COLGATE'S
SHAVING STICK

Best for tender skins—"remarkably free from uncombined alkali"..
Best in its cool refreshing effect on the face..
Best in its lathering qualities whether hot or cold water is used
Best in the lasting moisture of its creamy abundant lather..
Best in appearance—as pure as it is white..
Best in convenience—the handsome nickeled box with screw top.

From every point -the Best

Compare Colgate's with other shaving sticks.

Such broad perfection is found in two other shaving preparations—Colgate's Rapid-Shave Powder and Colgate's Perfected Shaving Cream—each the best of its kind.

With Colgate's you choose the method—the lather's the same: softening, soothing, sanitary.

A trial size of Stick, Powder or Cream sent for 4c. in stamps

COLGATE & CO., Dept. 55, 199 Fulton Street, New York

Makers of Cashmere Bouquet Toilet Soap—luxurious, lasting, refined

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